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VOL. XLIX No. 4 — APRIL 1934

The American City

ISSUED MONTHLY BY THE
American City Magazine Corporation
470 Fourth Ave., New York

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BRANCH OFFICES
Daily News Building, Chicago
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GEORGE S. CONOVER, Vice-President
402 Monadnock Bldg., San Francisco
DUNCAN A. SCOTT, Representative

Subscription, $2 per annum
($3 to Canada and foreign countries)
Single copies, 35c
Back numbers available

Entered as second-class matter, July 29, 1910, at the Post Office at New York, N. Y., under Act of March 3, 1879.
Printed in U. S. A.

In THE MUNICIPAL INDEX (the annual reference volume of data and condensed catalogs published by the American City Magazine Corporation) readers will find much material, including lists, and articles on a wide variety of municipal and civic subjects, not published in the monthly issues of the magazine.

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Now a Practical way to End Tuberculation

Public Works officials, please note. **Two men can easily handle a 13-foot length of 8" Class C Transite Pipe. All sizes up to 18" can be handled *without mechanical equipment.***

A splendid example of the remarkable flexibility of the Simplex Coupling. This railroad water line remains bottle-tight in spite of the constant vibration caused by passing trains.

Immune to corrosion, Transite Pipe was chosen to carry a water supply through this salt marsh and river. The pipe line, assembled on the bank with flexible, bottle-tight joints, was drawn under the surface of the river by a cable from the opposite shore.

Water supply line for a large industrial plant. The flexibility of the Simplex Couplings permitted fast, easy laying in a curved, irregular trench with changing grades, and caving banks.

A city water supply installation utilizing 8" Class C Transite Pipe. Simplex Couplings insured quick, easy assembly in spite of the freezing weather and a wet, slippery trench.

PERMANENT, economical and easy to install, Transite Pipe now provides a truly practical way to end, once and for all, the "bugbears" of tuberculation, soil corrosion and electrolysis.

Here is positive assurance against excessive pumping costs, reduced pressures, constant cleaning expense, shutdowns, costly renewals, and other evils all too familiar to the water works engineer and superintendent.

Composed of asbestos fibre and Portland cement, combined under pressure into a homogeneous structure of extreme density, Transite Pipe is virtually chemically inert and remarkably resistant to destructive agencies. It is strong, tough, and, like all Portland cement products, it actually grows stronger in service.

Constant High-Delivery Capacity

The smooth interior wall imparted to Transite Pipe by the polished steel mandrel on which it is made provides a surface with minimum resistance to the flow of water. The conservative minimum coefficient which may be expected from completed Transite lines in service is C-140. As Transite Pipe cannot tuberculate, the value of C remains unchanged with age. Consider this fact in relation to pumping costs alone, and you can realize the startling savings made possible by the use of Transite Pipe.

Flexible, Bottle-Tight Joints

Leaky joints not only may result in enormous water losses, reduced pressures and inadequate fire protection, but may actually cause breaks in mains due to undermining of the line. The Simplex Coupling used for underground Transite lines is absolutely bottle-tight even under severe vibration.

Low Installation Costs

With Transite Pipe and Simplex Couplings you save ⅓ to ½ the time required for making ordinary caulked joints.

You save time in trenching, too. The trench can be of minimum width; no provision for calking joints is necessary.

Light Weight

The light weight of Transite Pipe is especially important in connection with public works projects. Two men can easily lift and carry a thirteen-foot length of 8" diameter Class C. All sizes up to 18" can be handled without mechanical equipment.

For Culverts

Though originally designed for water mains, highway engineers have been quick to recognize the obvious advantages of Transite Pipe for culvert construction. Low installation cost and permanence without maintenance are its outstanding characteristics for this service.

For Handling Strong Waters, Corrosive Liquids and Gases

Its exceptional corrosion resistance has also led to the wide use of Transite Pipe for mine drainage and for industrial process liquor lines. Thousands of installations have also been made for venting corrosive fumes.

Send for New Brochure

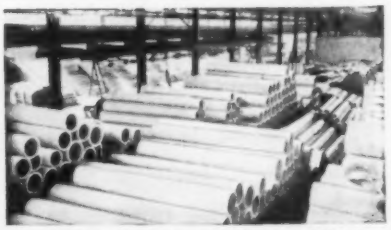
We shall be glad to send you a copy of the new brochure giving complete engineering details on J-M Transite Pipe. Just fill out and mail the coupon.

. . . Soil Corrosion . . . Electrolysis

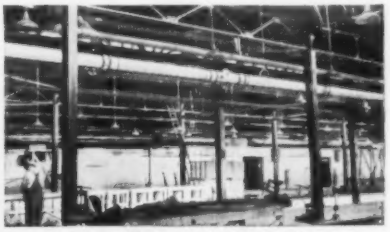
J-M TRANSITE PRESSURE PIPE

AN ASBESTOS PRODUCT

The soil was highly corrosive. Hence, the choice of Transite Pipe, which is unaffected by ordinary soil acids and alkalies, will not support tubercular growth, and cannot be destroyed by electrolytic action.



Part of the huge stock of Transite Pressure Pipe in the Johns-Manville Plant, at Waukegan, Ill.



Transite Pipe was chosen for the process water lines in this dye house because its immunity to corrosion obviates any danger of water discoloration.

Note the narrow trench. The Transite Pipe was assembled above ground, several sections at a time, and lowered into place. A fast, economical installation.

An installation in which Transite Pipe was used to combat electrolysis. Here 6" Class C pipe was employed. Connections were made with Dresser Couplings.

Piping water to a community on a hill. Transite Pipe, immune to tuberculation, provides positive assurance of adequate pressure for fire protection.

Send for FREE Brochure

Johns-Manville
TRANSITE PRESSURE PIPE

JOHNS-MANVILLE, 22 East 40th Street, New York City
Gentlemen: Please send me the new brochure on J-M Transite Pressure Pipe. AC-4A-34

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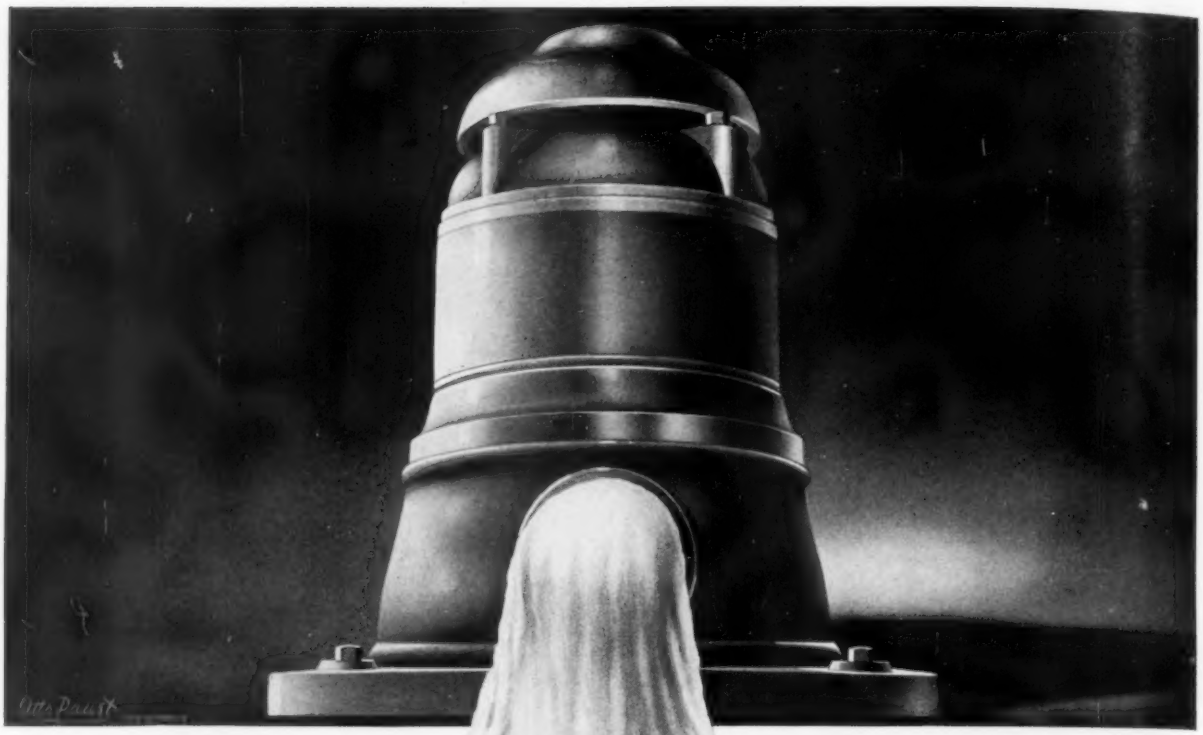
Do you mention THE AMERICAN CITY? Please do.



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AMONG the men who know . . . among impartial hydrological engineers who base their recommendation of the best in pumps and well water systems solely on fact and proof . . . the *first choice* of the majority is LAYNE. Why? Because LAYNE produces *results.* They know from experience that LAYNE means "more water . . . less cost," whether the demand is for hundreds or millions of gallons. Let the choice of these experts guide you in your selection of pumps and wells. Your guarantee is LAYNE'S 50 years as leader in its field, and an unmatched, world-wide organization. Our newest bulletins are yours for the asking.

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LAYNE PUMPS
AND WELL WATER SYSTEMS

PWA and Work Divisions Plans

(See also pages 42 and 77)

PWA Estimates Its 1934 Expenditures

A STATISTICAL study was received on March 24 by Public Works Administrator Harold L. Ickes indicating $1,382,000,000 would go from the public works fund into citizens' pockets during 1934 to increase purchasing power and re-employment and spread recovery.

The study showed PWA expenditures would reach the peak of $164,000,000 a month in June. Statutory and executive allotments totaling approximately one-third the entire PWA fund were not included in the compilation.

Administrator Ickes said:

"No promises of any kind have been or will be made by PWA in advance of delivery, but it is my desire to show what PWA seeks to accomplish and give some indication of what may be expected in this phase of the recovery program. There has been a lot of unjustified talk from sources independent of PWA about how much PWA could and should do. All statistics run the risk of misinterpretation, and PWA does not desire to raise false hopes.

"While Public Works can take over some of the persons employed by Civil Works, it will never take over all of them at one time. Also Public Works will give employment to many other persons who never worked on Civil Works jobs and result in wider indirect and industrial employment of benefit to capital goods industries. The two recovery measures have fundamental differences in procedure, while both aid recovery by the direct process of giving employment."

It was explained that the figure of $1,382,000,000 of PWA expenditure in 1934 was the best result of statistical compilations taking into consideration various base marks and factors affecting the program, for which no exact criterion exists.

The statutory and executive allotments from the $3,300,000,000 PWA fund excluded from this figure total $1,101,000,000. They included such items as $400,000,000 for the Civil Works Administration (all spent); $323,000,000 for the Civilian Conservation Corps (partly spent); $100,000,000 for the Farm Credit Administration; $100,000,000 for the Public Works Emergency Housing Corporation; $50,000,000 for the Tennessee Valley Authority; $25,000,000 for the Subsistence Homesteads Bureau; $25,000,000 for the Surplus Relief Corporation to retire submarginal lands from production, and other items.

From the balance of approximately a little over $2,000,000,000 from which the 1934 figure was drawn, the PWA made allotments for Federal and non-Federal projects, including many for loans and grants to municipalities and local governments, housing and railroads.

After compiling money actually expended from such allotments up to 1934, the statisticians calculated probable expenditures by months to get the flow of this recovery money to all sections of the country that will bring employment and rehabilitate purchasing power.

A steadily mounting figure per month was shown through the early months of 1934 with the velocity of expenditures increasing rapidly with the arrival of spring and summer. Unless other appropriations are made by Congress the flow of funds will dwindle through the fall to a minimum of less than $100,000,000 per month by the end of the year.

Work Divisions Replace CWA in Urban Regions

IN line with the policy for urban unemployment relief announced by President Roosevelt February 28, a detailed statement of the work-program policies of the Federal Emergency Relief Administration was made public by Administrator Harry L. Hopkins on March 19. The instructions to State Civil Works Administrations and State Emergency Relief Administrations (except those covering the interval prior to March 31) are here quoted in full:

1. ORDER

Effective March 31, 1934, the Civil Works Administration will be suspended and Work Divisions will be organized by the Emergency Relief Administration. All desirable local and state civil works projects in operation on the date of the suspension of civil works may be transferred to the Work Divisions of the Emergency Relief Administrations. All Federal projects and emergency educational projects are exempted from this order, and separate instructions will be given concerning them.

2. ORGANIZATION

Persons employed on civil works on the date of suspension may be transferred to the Work Divisions of the Emergency Relief Administration. Essential administrative and technical personnel may be transferred from Civil Works Administrations to the Work Divisions of the Emergency Relief Administrations.

3. LOCATION

The new program of work will be carried forward in towns and cities having a population of more than 5,000 and in counties or other political subdivisions which are determined by the State Emergency Relief Administrations to be predominantly urban or industrial. This determination will be submitted to the Federal Emergency Relief Administrator at once for review and approval.

4 EMPLOYMENT BASIS

Any additional persons employed will be selected on a basis of need by the Emergency Relief Administrations. Needy women shall receive equal consideration with needy men.

It will be the policy of the Federal Emergency Relief Administration to include in its monthly grants of funds to the states funds for the prosecution of the work program, and these grants shall be used to provide employment only for persons in need of relief.

5. METHOD OF OPERATION

The Work Division shall be responsible for the planning, organization and conduct of work for those certified to the Division as eligible for relief.

6. PROJECTS

All projects will be approved by the State Emergency Relief Administration and shall be of a public character, of economic and social benefit to the general public or to publicly owned institutions. They should be carefully planned to be of the greatest efficiency and the greatest benefit to the community or the state. They should be coordinated with larger plans for local and state improvement.

All projects must be carried on by force account (day labor), and not by contract.

All projects shall be undertaken independently of work under a contract or for which an annual appropriation has been made, and must be, in general, apart from normal governmental enterprises. It will not be allowable to include projects such as garbage collection, snow removal, street cleaning and lawn maintenance in parks.

7. MATERIALS

No separate grants will be made for material purchases.

8. HOURS AND EARNINGS

The hours of labor, earnings and other working conditions shall be fixed in accordance with the rules and regulations established by the Federal Emergency Relief Administrator as follows:

The hours of employment shall be not more than 24 hours per week. Time lost because of inclement weather, unavoidable delays, national and state holidays, or through conditions beyond the control of the employee, may be made up in the succeeding 20 days.

Wages will be at the prevailing rate for the occupation and the locality in which work is done and in no case will the pay be less than will yield thirty cents per hour, provided, however, that the hours shall be limited so that the maximum weekly earnings shall not in any case exceed the amount necessary to meet budgetary requirements.

These restrictions as to rates of pay and hours of employment shall not apply to administrative and supervisory personnel.

Prevailing rates for each locality shall be determined for various classifications of employment by a committee appointed by the local Emergency Relief Administrator consisting of one representative each from organized labor, business, and the local Emergency Relief Administration.

Complete information concerning wage rates established in each locality shall be forwarded to the State Emergency Relief Administration office as a matter of record.

9. GRIEVANCES

Adequate provisions for hearing grievances and for appeals shall be made through suitable adjustment boards or committees appointed by the local Emergency Relief Administration.

10 ACCIDENT COMPENSATION

The responsibility for providing accident compensation insurance rests with the states and localities.

11. SAFETY

Adequate provision shall be made for safety of employees and in so far as possible the activities of that department in the Civil Works Administration shall be maintained and carried on as a part of the Work Divisions of the Emergency Relief Administrations.

12. STANDARDS

It is intended that Work Divisions shall maintain as high a standard of professional, technical and engineering procedure, inspection, and labor relations as possible, and full organization and competent personnel for these phases of the work program shall be continued and kept at a high point of efficiency.

13. ACCOUNTING, DISBURSING AND REPORTING

Separate instructions concerning records, accounting, auditing, disbursing, and reporting will follow.

ELEVATED TANK maintains uniform pressure *in the waterworks system at* LITCHFIELD, ILL.

DID you ever stop to think that an elevated tank in a municipal waterworks system does not grow less efficient with age? A city may outgrow the capacity of its first tank and need additional storage, or the water needs may change so that additional mains are required.—but the elevated tank will always deliver its capacity at a definite minimum pressure.

In other words, an elevated tank 100 ft. to bottom will deliver 43 lbs. pressure per sq. in. at the tank site when it is thirty years old, just the same as it did the day it was erected. It is one of the few things that do not become less efficient with use and age.

The 200,000-gal. ellipsoidal-bottom tank illustrated at the right is a typical example. It was completed and cut into the waterworks system at Litchfield, Ill., early in 1927. Before the tank was installed, the pressure in the distribution system fluctuated as shown on the right-hand chart below. As soon as the tank was put in service these fluctuations were eliminated. Six years later, the pressure, as shown on the other chart, is just as uniform as when the tank was installed.

In addition to improving service, elevated storage in a municipal waterworks system reduces operating costs. At Litchfield the cost was gradually reduced from 6 cents to 4.8 cents per thousand gallons pumped in about four years.

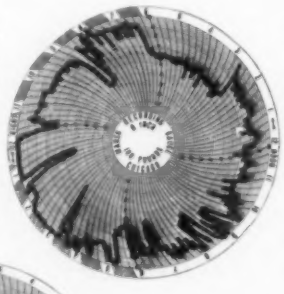
With elevated storage, pumps may be operated uniformly at their most efficient rate. When more water is pumped than used, the surplus goes into the tank. From there it flows back into the system when needed, without repumping.

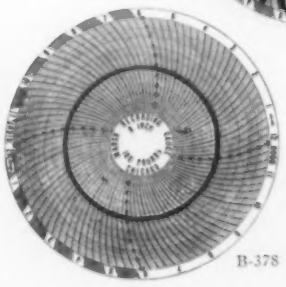
We shall appreciate the opportunity of discussing the advantages of elevated storage with municipal officials and waterworks engineers. Write our nearest office.

200,000-gal. ellipsoidal-bottom elevated tank at Litchfield, Ill.

Right: Pressure in water mains at Litchfield, Ill., Jan. 7, 1927, before elevated tank was installed

Below: Pressure in water mains on June 30, 1932





B-378

CHICAGO BRIDGE & IRON WORKS

Chicago	2127 Old Colony Bldg.	Birmingham	1302 Fiftieth St., N.
New York	3108 Hudson Terminal Bldg.	Dallas	1206 Burt Bldg.
Cleveland	2236 Rockefeller Bldg.	San Francisco	1033 Rialto Bldg.
Detroit	1501 Lafayette Bldg.	Houston	2919 Main Street
Philadelphia	1616-1700 Walnut St. Bldg.	Tulsa	1625 Thompson Bldg.
Boston	1501 Consolidated Gas Bldg.	Los Angeles	1403 Wm. Fox Bldg.

Plants in BIRMINGHAM, CHICAGO, *and* GREENVILLE, PA.

Water Supply and Purification

Water-Supply Development in the United States

IN 1652, Boston, Mass., introduced the first American public water supply. The first mechanical pumps were used in 1761 at Bethlehem, Pa., where Hans Christiansen, an American pioneer water-supply engineer, made his pumps work "after severe struggles." But despite his example, progress was slow in water service. In 1850 there were only 100 water plants in the United States, and as late as 1875 only 243. About that time the vital need for water service was realized, and in twenty years the plants increased to some 3,000. In 1933, there were more than 11,000 public water supplies, some serving more than one community. The old oaken bucket is a thing of the past, and so is the hand-pump fire brigade.

Early water-supply plants delivered water through short lengths of pipe, by gravity from nearby sources, with little or no emergency storage. The first pipes were bored logs, and after them came lead pipe. Then cast iron pipe was introduced, from England, which also, in 1848, sent us the idea of coating pipe with a tar preparation, to prevent corrosion. Today steel and concrete pipe also are in use.

Pumping methods improved as cities spread farther from water sources and as people desired pressure in the upper floors of their homes and office buildings. Steam pumps were the rule for many years after Christiansen's "severe struggles." Wood and coal were the fuels, and reciprocating pumps were the main reliances, with centrifugal pumps used only for low lifts. In the 80's high-duty attachments to horizontal pumps, and vertical triple expansion pumps of still higher duty, made the pumping plants more efficient. Today the use of steam turbines has made possible the design of pumping equipment requiring less space than the larger pumping engines, which are, however, efficient and economical from an operating standpoint.

Internal-combustion engines also are used, especially for small capacities, and crude oil is sometimes used for fuel.

Early purifying processes were incomplete. Often consumers simply trusted the water was pure, but in some cities the surface supplies were passed through so-called filters or strainers of gravel, charcoal or sponge, or infiltration basins. Slow sand filters of the English type were adopted at Poughkeepsie, N. Y., in 1870. Later, rapid, or mechanical filters were built. Now nearly all surface supply water is treated with chlorine, the chlorination process having been developed in 1908.

—From "Water Service," published by the Indianapolis Water Co.

It Is All Done with Mirrors—and Welding

A SECTION of the town of Oakmont, Pa., recently had its water supply jeopardized by the cracking of an 18-inch cast iron water main. Because of the location of the crack, a circumferential fracture just next to a flange, the Water Company welders decided to call in an oxy-acetylene service operator for suggestions. The pipe was about 7 feet below the ground level and ran at an acute angle through a concrete foundation from the water pump to the service line. As the location of the crack on the side nearest the concrete wall gave only a 7-inch clearance between the pipe and the wall, the job was difficult. The nature of the crack obviously indicated a bronze-welded repair job in place.

The welder's mechanics chipped off the pipe and prepared a good vee around it for the bronze-welding job. When this was done, the flange which had broken off was tack-welded in position ready for bronze-welding.

The welding proved to be not at all difficult. The problem of handling the section of the weld where there was only a 7-inch clearance between the pipe and the wall, was solved by the simple expedient of using a mirror. The mirror was placed at an angle underneath the pipe so that by working from the opposite side the operators could see exactly what they were doing. In this way the work was easily completed, using 75 pounds of all-purpose bronze-welding rod.

An inspection the following day while the main was under pressure and in use showed a successful weld.

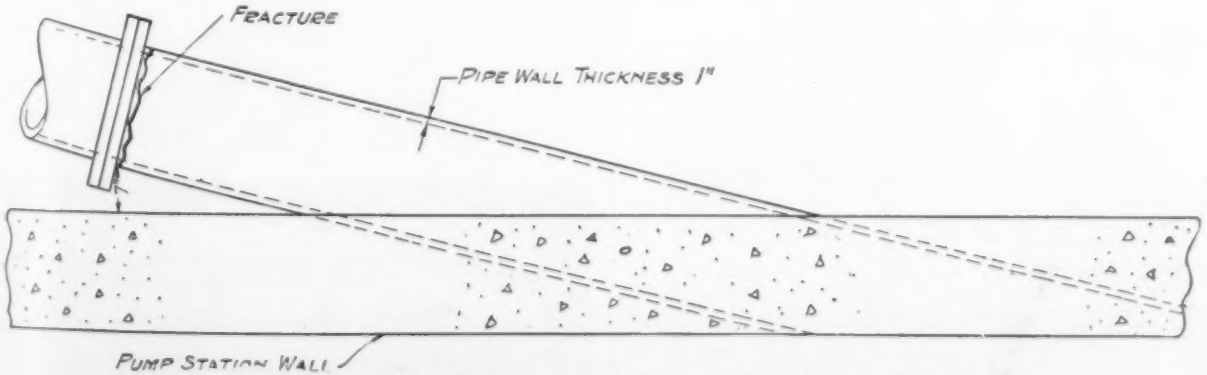
—Superintendent, Suburban Water Company, Oakmont, Pa.

The Life of Lead Water Services

SYRACUSE, N. Y., Allentown, Pa., and Clarkburg, W. Va., are three cities in which lead pipe predominates for water services. They are cities of varying size and conditions, situated in different parts of the country. Of the 40,000 water services in Syracuse, about 30,000 are lead. With this large number of lead services in the ground, the Water Department, with experience running back to 1893 when it became a municipal system, has no record of failures of lead pipe except where caused by some unusual mechanical injury or improper workmanship, and even these are few. Although its records do not go back more than 41 years, the Department knows that a large number of lead services were installed before that time and are still intact. Services from the street main to the curb are installed by the Water Department, and from the curb to the house by the plumber.

There are approximately 23,300 water services in Allentown, of which more than 20,000 are lead. Practically all services 2 inches and under are lead pipe, while those over 2 inches are cast iron jointed with calked lead. The distribution system is cast iron pipe with lead joints. Pressure on the mains runs from 27 to 103 pounds, and the average on the city services is 57 pounds.

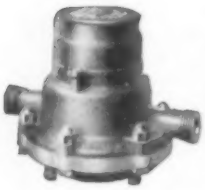
Clarksburg has approximately 6,000 lead water services serving a population of about 34,000. They have been used continuously since 1889, with many of the original lead services still in use. Clarksburg also uses lead for jointing cast iron mains.



THIS SKETCH SHOWS THE LOCATION OF THE CRACKED PIPE RELATIVE TO THE CEMENT WALL IN OAKMONT, PA.

Uncompromising quality

IN THE DISC



"NOT how cheap, but how good."

Never in all the history of the building of many hundreds of thousands of water meters, by the Buffalo Meter Company, has the question of quality been subordinated to price consideration.

How well this policy has been carried forward during the past forty-two years of building fine water meters, is quickly evidenced by the sturdy construction of the discs used in these meters.

The disc is made of hard rubber, extra thick for extra accuracy-seal, and reinforced by an aluminum alloy plate, perforated and moulded into the rubber. It is rough machined, seasoned, then finished machined, making all surfaces true, and free from warping strains.

When your water works invests the taxpayers' money in Niagara and American Meters, you are making an investment in permanence, sustained accuracy, and performance. Don't be tempted by offers of substitute meters which are claimed to be "Just as good." There is no substitute for quality, and the Buffalo-Made Water Meters have been the standard of comparison for forty-two years.

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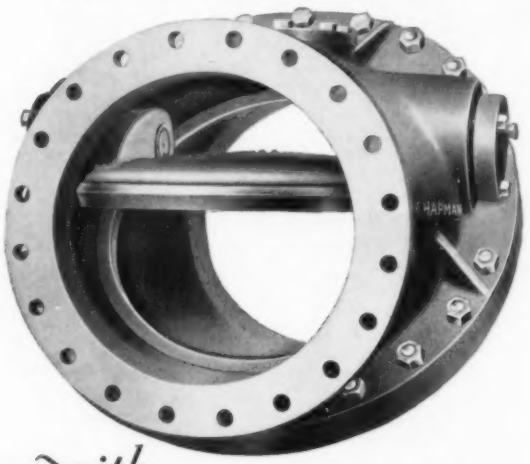
2902 Main Street Buffalo, N. Y.

NIAGARA and AMERICAN Water Meters

75% REDUCTION IN HEAD LOSS

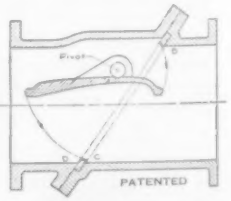


with **Chapman** NON-SLAM CHECK VALVES

THE BALANCED DISC of a Chapman Non-Slam Check Valve is supported by two bearings and requires very little force to hold it off its seat. As a result, head loss is approximately 75% less than that caused by the ordinary type of check valve.

There are no pockets or sudden enlargements to break the free flow or to hold sediment. The body of this valve is designed with clear lines throughout and the net area at all points is equivalent to the area of the pipe line.

A steadily increasing number of these valves are in use on water, oil, gas and air lines. Write for the illustrated booklet that fully describes the many advantages of the new Chapman Non-Slam Check Valves.



A cushioning effect, obtained by forcing the short flap of the disc against the stream, prevents slamming.

THE CHAPMAN VALVE MANUFACTURING CO.
INDIAN ORCHARD, MASSACHUSETTS

Water Meters Check Revenue Losses

Financial Policy of the Pasadena, Calif., Water Department

THERE has been no change in water rates in Pasadena since July 2, 1924, when the present water rates were established to meet the added costs incident to the continuing recession in the ground-water levels. Within the original city as existing in 1912, when the Water Department was organized, replacement of water mains is made without cost to abutting property, and extensions in existing streets are made at the rather nominal charge of 50 cents per front foot. In territory annexed to the city since November 1, 1912, and in new subdivisions, new cast iron mains are assessed to the property benefited thereby.

The following rates are charged by the Pasadena Water Department for water furnished within the city limits.

DOMESTIC RATES

Size of Meter in Inches		Monthly Minimum Charge
⅝″	For first 500 cu. ft. or less..	$1.00
¾″	For first 500 cu. ft. or less..	1.15
1″	For first 500 cu. ft. or less..	1.40
1½″	For first 700 cu. ft. or less..	2.10
2″	For first 1,000 cu. ft. or less..	2.85
3″	For first 1,500 cu. ft. or less..	5.60
4″	For first 2,000 cu. ft. or less..	8.10
Water used in excess of minimum charge, per 100 cu. ft.....		0.13

IRRIGATION RATES

Rate for irrigation service is $0.06 per 100 cubic feet plus the following monthly service charge:

⅝″ meters	$ .45
¾″ meters	.50
1″ meters	.60
1½″ meters	.85
2″ meters	1.10
3″ meters	1.85
4″ meters	2.35

The Department charges for new service connections but not for meters other than irrigation meters, in accordance with the following schedule:

¾″	$15.00
1″	20.00
1½″	35.00
2″	45.00
Larger than 2″	Actual cost

Where services are forced in ahead of street work by resolution of the Board and assessments are collected by the Street Department, 10 per cent is added to the above charges by that Department.

The Water Department, since it was organized on November 1, 1912, has not received any revenue whatsoever directly from the general tax levy. It meets all operation, maintenance, depreciation, bond interest and redemption, as well as much construction, from its normal revenues. Water is furnished to the city for fire purposes and for flushing of sewers free of charge, although such a practice is not defended as being equitable to the water user. Water is furnished to the city for park and power plant purposes at the low rate of 6 cents per 100 cubic feet, which is less than one-half the domestic rate of water. On the other hand, the Water Department pays for every service received from the departments of the city, including rental of space occupied in the City Hall and other buildings, light, power, heat, janitor service and portions of the salaries of the City Manager, City Attorney, Controller and other officers and employees rendering any ordinary or special service to the Water Department.

HISTORY OF WATER SUPPLY

Conquering The Typhoid Terror

DURING the war days of '98 it was sometimes said that the soldiers were safer during a battle than in camp. At any rate, infinitely more of them died in the concentration camps of typhoid fever than were slain by Spanish bullets.

Typhoid had been a scourge throughout the whole of the Nineteenth century. The growth of the cities had greatly multiplied the danger of a polluted water supply—one of the long unsuspected sources of this disease.

Today the death rate from typhoid is almost negligible, and epidemics are rare. Next to the isolation of the *bacillus typhosus*, the principal factor in the conquest of typhoid fever has been the modern water supply system, with its facilities for scientific purification.

NO. 15 OF A SERIES OF WATER ADVERTISEMENTS USED IN LOCAL NEWSPAPERS BY THE AMERICAN WATER WORKS & ELECTRIC CO.

Meters Help City Water-Works Profits

DESPITE the depression and an unprecented delinquency problem, the water works of South Bend, Ind., ended 1933 with a net profit of $179,170.52. The gross income of the Department was $446,772.25 in 1933, compared with $464,065 in 1932 and $501,692 in 1931, the net income of those years being $153,641 and $117,150 respectively.

The Department ended the year with approximately $65,000 in delinquent private consumer bills on its books, but it is expected that between 75 per cent and 80 per cent of this will be collected. Delinquent bills five weeks before the end of the year ran about $68,000. The largest delinquent is the city of South Bend itself, which owes $213,436.69 for fire-hydrant rentals alone. The Park Department and the Board of Public Works also owe considerable sums.

The Water Department still has $56,959 in meter deposit funds tied up in closed banks, but the total of the meter deposit funds is in excess of $100,000. The cash on hand account was approximately $80,000 at the close of the year. Out of this sum, the Department is furnishing $25,000 worth of material for the CWA program on water-works projects. These projects consist mainly of connecting dead ends to afford better circulation and more uniform pressure in various parts of the city.—FRANK R. WISNIEWSKI, Superintendent.

Madison, Wis., Has Been Nearly 100 Per Cent Metered for 20 Years

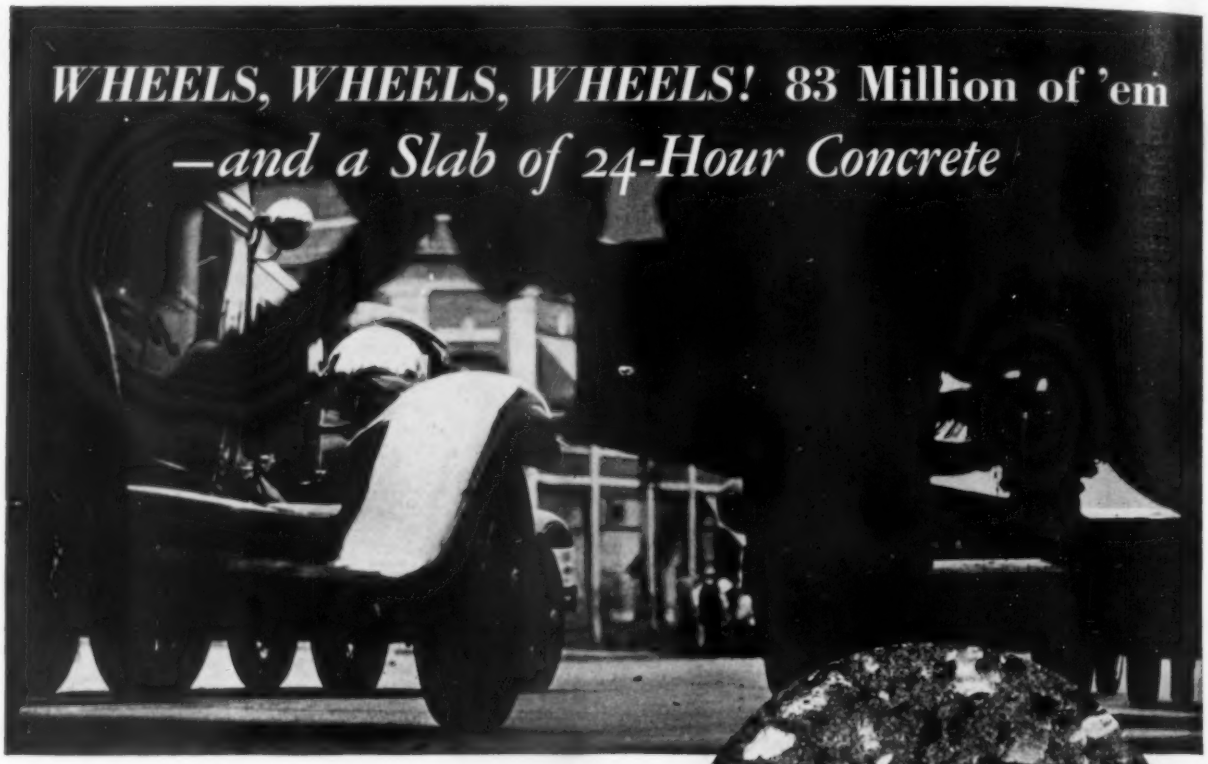
MADISON water services have been nearly 100 per cent metered for over twenty years. The increase in per capita consumption in this time, even with complete metering, has been interesting and shows that there has been an increase in the use of water through improved plumbing facilities. In 1900, when Madison had a population of 19,164 and the services were 94 per cent metered, the consumption was 44 gallons per capita daily. This rose to 75 gallons in 1910, when the services were 99 per cent metered and the population was 25,531. In 1920 the population was 38,378, the services were 99.5 per cent metered and the consumption was 102 gallons per capita daily. This still further increased to 120 gallons per capita daily in 1930, with 99.8 per cent of the services metered, and the population was 57,899. The 1932 population was 60,000, the services were 99.9 per cent metered and the consumption was 122 gallons per capita daily.—L. A. SMITH, Superintendent, Water Works.

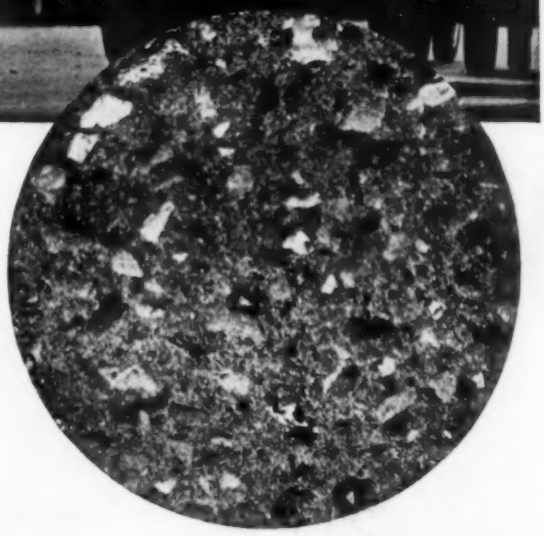
Newton, Mass., Reduces Water Rates

THE city of Newton, Mass., reduced its water rates 10 per cent in 1932, from 25 to 22.5 cents per 100 cubic feet, and for 1934 has reduced them 11.5 per cent, to a flat price of 20 cents per 100 cubic feet. This reduction was made possible by savings effected by reorganizing the administration and maintenance methods and equipment of the Department before and since the beginning of the city's "four-year plan" of water development in 1931.

Savings of $17,000 a year in developing and delivering the water into the mains will enable the city in ten years to write off the $199,350 cost of installation of new pumping equipment. Except for $200,000 in bonds, all of the $468,000 expended to date has been met from current revenue. The Department in 1929 had a deficit of $23,600, and at present it expects to show a net cash surplus approximately $180,000. — RICHARD H. ELLIS, Water Commissioner.

WHEELS, WHEELS, WHEELS! 83 Million of 'em —*and a Slab of 24-Hour Concrete*





Pounded by Six-Years' Traffic on Nation's Busiest Highway, 'Incor' Concrete in Perfect Condition

Back in 1928, shortly after 'Incor' 24-Hour Cement was first introduced, a Boston Post Road repaving job reached the heavily-traveled Main and Echo Avenue intersection, New Rochelle, N. Y. This road carries the bulk of passenger and truck traffic between New York, its suburbs and New England,—20,000 vehicles a day.

To reduce detour time, 'Incor' was used for half of the intersection. First important 'Incor' job in the New York area, engineers watched with critical eye. Yes, without question, it was gaining strength rapidly—but could it carry full traffic load in a single day?

Cylinders were tested at 24 hours; 10 minutes later barriers were down, the highway opened. Two hours later, a 30-ton steam shovel on a 10-ton carrier passed over the new concrete!

Pounded by 83 Million Wheels!

Three years later, cores of 'Incor' and of same-age ordinary Portland cement concrete were cut and tested. 'Incor' averaged 6417 pounds per sq. in., ordinary cement 5516. Last March the photograph (at the right) was made with an ordinary camera. It shows as pretty a slab of concrete as anyone would want to look at. Pounded by ceaseless traffic, 10,000 cars a day for 5 years and 8 months—83,000,000 wheels, if the slide-rule didn't slip!

'Incor' makes better concrete because it is better cement—it has to be a better-quality cement to harden in 24 hours. Hardening in one-fifth to one-seventh of the time required by ordinary Portland, 'Incor' now makes it possible to eliminate highway detours and avoid business losses caused by long-closed traffic arteries.

In concrete buildings, column forms are stripped first morning after concreting, floor forms that afternoon; one form-set does the work of several, reducing form and handling costs; financing expense reduced, revenue from investment begins sooner.

The price of 'Incor' is now only little more than ordinary Portland Cement—a fraction of resulting economies. 'Incor'* is made by the producers of Lone Star Cement, subsidiaries of International Cement Corporation, New York, and is sold by other leading cement manufacturers.

* Reg. U. S. Pat. Off.

'INCOR' 24-Hour Cement

When you write for that catalog, kindly mention THE AMERICAN CITY

Street Cleaning—Anti-Skid Roads—Airports

Street Cleaning in Upper Darby Township, Pa.

DURING 1933 our newer pick-up sweeper was operated in two shifts, totalling fifteen hours daily. All township streets were swept the day after ash and rubbish collection, and the West Chester Pike, Garrett Roads and 69th Street business sections were cleaned at 4 A.M. Wednesday and Saturday mornings. This sweeper averaged 58 running miles and 25 miles swept per day. Considering the fact that this piece of equipment was operated fifteen hours per day, comparatively little time was lost while making necessary repairs. The sweeper was repainted during the year.

During the months of October and November our other sweeper was again placed in operation removing fallen leaves. The amount of this work performed was limited only by the capacity of the trucks removing the waste material to the dump. Trucks following this sweeper hauled sixteen to twenty loads per day each.

Main sweeper brooms and gutter brooms for this equipment are refilled by the Highway Department employees. The main brooms require three men three hours each, and the gutter brooms one man for eight hours. The main brooms are refilled with hickory, and the gutter brooms with wire.—SAMUEL H. WALKER, Chairman, Highway Committee.

Highway Department Combats Icy Roads

MORE than forty million pounds of sand and cinders were used by the Minnesota State Highway Department during the past winter in making icy roads safer for traffic. This has been an unusually bad winter for slippery roads in many parts of the state, and the Maintenance Division of the Highway Department did more than the ordinary amount of sanding. Hills and curves on hard-surfaced highways received the greatest attention. The Department purchased more than 184 tons of calcium chloride, which was mixed with the sand and tends to hold it on the ice instead of permitting the sand to be swept off by traffic.

A Survey of Time Saved by the Newark High-Level Viaduct

A PAPER by Lawrence S. Tuttle, of the U. S. Bureau of Public Roads, presented at the thirteenth annual meeting of the Highway Research Board, was based on studies of the annual vehicle time saved by the new high-level viaduct from Newark, N. J., to the Holland Tunnel under present traffic conditions. Field studies of the travel time before and after the opening of the viaduct were made by the Division of Transport, Bureau of Public Roads, with the cooperation of the New Jersey Highway Commission. The importance of time saving on this route was indicated by the fact that an average of 30,000 vehicles pass over it each week day and 45,000 on Sundays.

The viaduct has no grade intersections, provides two traffic lanes in each direction, eliminates drawbridges over two rivers, and has shortened the distance by one-half mile. The trip times of 18,500 vehicles over the old route were compared with those of 8,400 vehicles on the viaduct. As a result of the study, it is estimated that the maximum saving of the vehicles using the viaduct is 60,563,000 vehicle-minutes per year, and that by reason of the lessened traffic the vehicles still using the old route save 5,542,000 vehicle-minutes per year.

Airports and Landing Fields in the United States

THE latest report of the Aeronautics Branch of the Department of Commerce, dated January 1, 1934, states that there were 2,188 airports and landing fields in the United States on that date, an increase of 71 since January 1, 1933. These figures do not include new airports which are being established in the various states by the State Civil Works Administration Committees.

A total of 637 of the airports of record January 1 were fully or partially lighted for night use. There were 563 municipal and 652 commercial airports; 265 Department of Commerce intermediate landing fields, 550 auxiliary fields, 55 Army and 18 Navy airdromes and stations; and 85 miscellaneous Government, private and state airports and landing fields.

On January 1, 1933, the division was as follows: 549 municipal, 621 commercial, 352 intermediate, 476 auxiliary, 51 Army, 15 Navy, and 53 miscellaneous Government, private and state airports and landing fields, totaling 2,117.

California led all other states in the number of airports and landing fields on January 1, 1934, having a total of 211, while Texas was second, with 144. Ohio, with 117, occupied third place. Texas, in addition to having the second largest total, had the largest number of municipal airports, 52. Pennsylvania led in the number of commercial airports, with 70. Alaska had the largest number of auxiliary fields, 71.

Remote Control of Airways' Radio Range Beacons

OPERATORS of municipal airports will be interested in the most recent development of the Aeronautics Branch of the Department of Commerce in the remote control of radio range beacons by wireless. Radio range beacons transmit signals which enable airmen to follow the airway courses when visibility is so poor that landmarks and beacon lights cannot be seen from the air. They are turned on and off at intervals, as the range signals must be silenced during broadcasts.

Since the range beacons have high radio towers which can not be erected near airports or intermediate landing fields, because they would constitute obstructions to air navigation, these transmitters are installed at sites several miles away from the landing fields and are operated by remote control. This operation is usually carried out on the Federal Airways System by means of telephone wire circuits with dial switches. An operator at the airport or intermediate field dials a number, and the radio range beacon several miles away immediately goes into action.

At locations where wire circuits cannot be economically provided, the radio system of remote control will serve a similar purpose. When the operator wishes to turn on the radio range beacon, he will press a key, sending out a signal from a small low-powered radio transmitter. A receiving set at the beacon site, which will always be tuned to the frequency of the low-powered transmitter, will pick up this signal, and respond by closing a switch to start the radio range beacon. When the operator wishes to discontinue the directional signals, he will press the key again, and the receiving set at the distant location will silence the radio range beacon.

The Skidding Characteristics of Road Surfaces

THE coefficients of friction of rubber tires on various road surfaces both wet and dry were measured for both straight ahead and sideways skidding at speeds of from 3 to 40 miles per hour, by means of an ingenious special integrating dynamometer, in the studies made for the paper on the skidding characteristics of road surfaces, presented by Prof. R. A. Moyer, of Iowa State College, at the thirteenth annual meeting of the Highway Research Board in Washington, D. C. Tests were run upon twenty-five different types of surface, including asphalt, tar, road oil, portland cement, brick, gravel, cinders, asphalt plank, steel plates, wood plank, and mud on concrete. In general, a marked decrease in the coefficient of friction with an increase in speed was noted, although the reverse was true in the case of the gravel and cinder surfaces, probably due to digging in as well as to friction.

The "sand-paper" finish in the case of sheet asphalt and rock asphalt surfaces was found to give high resistance to skidding, which leads to interesting deductions for the design of bituminous surfaces. The portland cement concrete surfaces gave very consistent results in locations as far apart as Iowa and Indiana. Some increase in the coefficient of friction was noted for wire-cut vertical fiber brick as compared with repressed brick.

Announcing

GAMEWELL-WESTINGHOUSE
Police Radio System

TWO pioneers and outstanding companies in broadcasting and police signaling fields have joined forces in the development and sale of the most advanced equipment for the apprehension of criminals and the coordination of the police services.

For seventy-five years The Gamewell Company has stood first and foremost in the upbuilding of signaling systems to facilitate the work of the police forces of this country, and has installed upwards of seventy-five per cent of all existing Municipal Police Signaling Systems.

The Westinghouse Electric & Manufacturing Company has been a pioneer in radio signaling and broadcasting since its inception in 1920 with the pioneer station KDKA at Pittsburgh, closely followed by the installation of stations WBZ at Springfield and WBZA at Boston, Mass.

Since 1920 the Westinghouse Company has continuously developed and manufactured radio apparatus for both commercial and radio police purposes. The Westinghouse Company has furnished a substantial portion of the radio transmitting apparatus to the United States Government over a period of ten years. The latest development of Westinghouse is the introduction of Two-way Police Radio, utilizing ultra high frequency of transmission or short waves 5 to 10 meters.

The combination of Westinghouse and Gamewell in connection with radio police signaling enables municipalities to avail themselves of the research experience, facilities and service of these two outstanding companies.

We stand ready to furnish for immediate delivery transmitters and receiving equipment. We are also prepared to survey your City and furnish information upon request.

THE GAMEWELL COMPANY
NEWTON, MASSACHUSETTS

Police and Fire Departments

Depression Effects on Local Police Administration

DEMAND for economy has forced police administrators to view critically their working forces and facilities the past few years, and police service has improved thereby, says Bruce Smith, Institute of Public Administration, in the March issue of *Public Management*, monthly magazine of the International City Managers' Association.

When cuts in forces were necessary, well-considered man-power adjustments have been made by letting vacancies go unfilled and increasing the number of retirements. This brought a new consideration of badly managed pension funds. Disciplinary powers have also been used in some cases, to weed out unfit personnel.

In general, according to Mr. Smith, there has been a gratifying restraint in the summary reduction of police quotas, which separates the young, vigorous and more promising men from the service. The average age of the force has been lowered, which is an advantage.

Although traffic studies, statistical work and protection of school crossings have brought in many emergency police employees, the real force in most cities has been recruited with caution. Standards of selection and training have been kept up.

Decline in police strength has resulted in increasing use of mechanical and electrical devices. Police radio broadcasting systems and motorized patrols are becoming more common in small as well as in large cities. This often means better service for less money.

Payless paydays and other difficulties through which police have kept their loyalty have further confirmed the belief that community esteem and traditions of the force, rather than high salaries, make good policemen, Mr. Smith comments. He makes the point, however, that police salaries must at all times be maintained at a level constant with a comfortable standard of living.

Charging for Fire Department Service

COLLECTING expenses from careless citizens who start fires, and making charges on calls outside the corporate limits, are two ways by which some thirty of the larger American cities distribute the cost of their fire protection, according to information gathered by the American Municipal Association.

Two cities—Cincinnati and Berkeley—have unusual legal provisions on the liability for negligence. Cincinnati gives its Fire Chief and his deputies authority to order correction of all fire hazards. There is a fine of $100 for the offender who fails to obey. If a fire has resulted directly or indirectly from neglect to comply with any orders of the Chief, the city sues the offender in civil action for all costs of putting the fire out.

The California city has the same provision, computing fire extinguishing costs per hour from actual Fire Department operating expenditures of the previous year. The formula is 1/24 of 1/365 of these annual operating costs.

Thirty-one of the 82 cities in the 50,000-or-over population class charge for making "out-of-town" runs. Seven of them charge by the alarm—from $50 to $200 a call. Grand Rapids, Mich., one of these, charges township supervisors $25 for a response of truck or chemical, $5 per mile to and from the fire, and $25 per hour for all time consumed.

Nine cities rent their equipment by the hour for service outside the city. Baltimore charges $25 an hour for engine or truck service, and $50 an hour for fireboat service outside the city limits. Toledo charges $75 an hour for each piece of apparatus.

Among cities which bring in revenue by other special charges is St. Louis, which charges $10 an hour for pumping water out of basements, and $5 for filling cisterns. Schenectady and Elmira, N. Y., ask return for recharging fire extinguishers.

Building Up State Police

STATE police can be made a superior weapon against crime. When people of the country overcome their suspicion of "remote control" in law enforcement, state police can become a strong, binding link in police administration. The states which have already made their police more than highway patrols indicate this.

Bruce Smith, of the Institute of Public Administration, writing in the March issue of *State Government*, official magazine of the American Legislators' Association, forecasts this future for state police.

The setting-up of the Pennsylvania State Police, Mr. Smith points out, was recognition that the sheriff-constable system had broken down, leaving the rural sections without enough protection. It marked a new era in rural police administration in granting extensive powers to the Superintendent of State Police, who is responsible only to the Governor. From the beginning, Pennsylvania has had a mounted and uniformed body of police, using a widely distributed system of troop headquarters and substations as a base of operations and continuously patrolling the entire state.

Maine in 1929 made a similar move by extending the powers of its State Police to include maintenance of general police patrols and the conducting of criminal investigations throughout the state. Eight other states have given their state highway patrol forces some degree of police authority.

Awards Announced for Inter-Chamber Fire Waste Contest

THE winner of the Grand Award in the 1933 Inter-Chamber Fire Waste Contest is Lakewood, Ohio. This announcement was made on March 30 at a meeting of the National Fire Waste Council, which sponsors the contest jointly with the Chamber of Commerce of the United States.

Lakewood and the other winners in the population groups will receive their awards at the annual meeting of the National Chamber in Washington in May, as having made the best year's records in checking fire waste and in promoting fire prevention activities.

The 1933 contest made an exceptionally good record in the reduction of fire losses, the per capita loss of the competing cities having been $1.37, the lowest in the history of the contest. The total loss last year in the 388 contesting cities, with a combined population of 35,000,000, was $48,150,429 as against an average of $82,925,000 in the five-year period ending with 1932.

A list of the winning cities and those receiving honorable mention follows:

Grand Award—Lakewood, Ohio

CLASS I—CITIES OVER 500,000 POPULATION

Winner—Philadelphia, Pa.

Honor Cities

Detroit, Mich.	San Francisco, Calif.
Pittsburgh, Pa.	St. Louis, Mo.
Milwaukee, Wis.	Cleveland, Ohio

CLASS II—CITIES FROM 250,000 TO 500,000 POPULATION

Winner—Providence, R. I.

Honor Cities

Indianapolis, Ind.	Atlanta, Ga.
Cincinnati, Ohio	St. Paul, Minn.
Rochester, N. Y.	Toledo, Ohio
Kansas City, Mo.	New Orleans, La.
Memphis, Tenn.	San Antonio, Texas

CLASS III—CITIES FROM 100,000 TO 250,000 POPULATION

Winner—Hartford, Conn.

Honor Cities

Grand Rapids, Mich.	El Paso, Texas
Wichita, Kans.	New Haven, Conn.
Youngstown, Ohio	Springfield, Mass.
Tacoma, Wash.	Ft. Worth, Texas
Nashville, Tenn.	Honolulu, Hawaii

CLASS IV—CITIES FROM 50,000 TO 100,000 POPULATION

Winner—Lakewood, Ohio

Honor Cities

Pasadena, Calif.	Durham, N. C.
Greensboro, N. C.	Schenectady, N. Y.
Asheville, N. C.	Union City, N. J.
Savannah, Ga.	Bethelehem, Pa.
Berkeley, Calif.	East Orange, N. J.

CLASS V—CITIES FROM 20,000 TO 50,000 POPULATION

Winner—Owensboro, Ky.

Honor Cities

Parkersburg, W. Va.	Pomona, Calif.—Tied
Elyria, Ohio	Muskegon, Mich.—Tied
Baton Rouge, La.	Great Falls, Mont.
Mason City, Iowa	Wichita Falls, Texas
Newburgh, N. Y.	

CLASS VI—CITIES UNDER 20,000 POPULATION

Winner—Palo Alto, Calif.

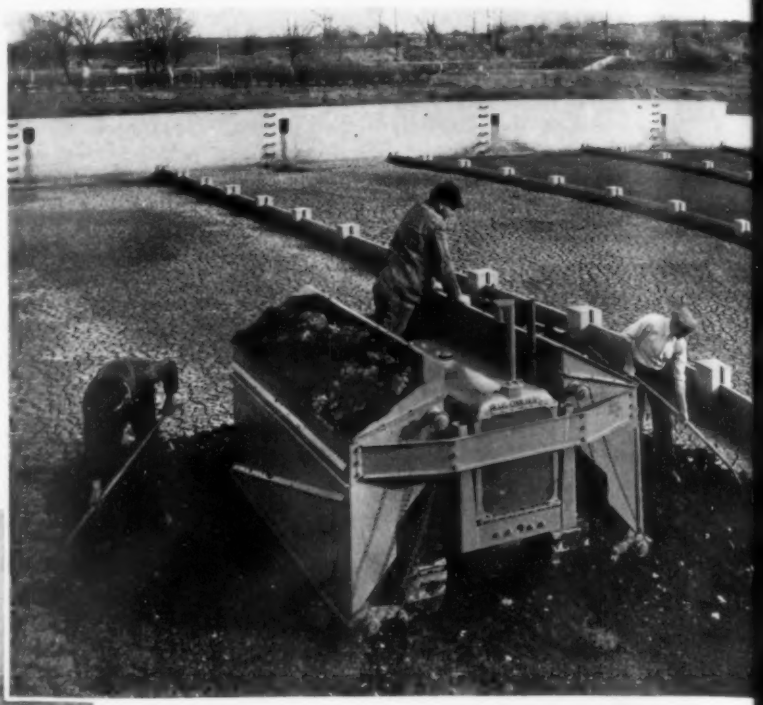
Honor Cities

Ridgewood, N. J.	Billings, Mont.
Valley City, N. Dak.	Gastonia, N. C.
Albany, Ga.	Hastings, Nebr.—Tied
Ellis, Kans.	Geneva, N. Y.—Tied
Lafayette, La.	Colfax, Wash.

NEW DEVICE FOR HAULING AND DUMPING SEWAGE SLUDGE
Designed for Springfield Sanitary District

Springfield, Ill.

Sewage treatment plants using sand drying beds are continuously confronted with the problem of removing the dried sludge. The Springfield, Illinois, Sanitary District tried many different methods of removing this sludge without damaging the sand beds but none proved successful until the idea of "Saddle Bags" mounted on a track-type tractor was developed. Allis-Chalmers cooperated with W. B. Walraven, Sanitary Engineer, in developing these "Saddle Bags" for the A-C Model "M" tractor, and according to Mr. Walraven, this method of sludge removal will probably supplant most of the methods heretofore commonly used. The bins have a capacity of two and three quarters yards of sludge, equally divided between the sides and side dumped by the operator. The total ground pressure amounts to only ten pounds per square inch. The loading edges are about 3.5 feet above the sand which permits easy loading. The bins are easily removed so that the tractor may be used for other work around the plant.



Allis-Chalmers "Saddle Bags" on Model "M" tractor removing dried sludge at Springfield, Illinois.

Amarillo, Texas

Amarillo is a thriving city in the panhandle country of Texas and they have a great many new streets to construct and maintain. They purchased for this work two Allis-Chalmers wide track Model "K" tractors and two Allis-Chalmers "10-K" graders. With this equipment they have been able to properly take care of new construction, maintain the older streets, do other work around the city, and all at a big saving over the old equipment that was formerly used. Many other cities have found it a false saving to try to do their work with old equipment and are modernizing for real economy.

Fergus Falls, Minn.

Fergus Falls knows the economy of using Allis-Chalmers equipment. They have operated a Model "K" for five seasons with no repair expense. Walter Weaver and Oscar Mesna, operators, are mighty proud of what they have accomplished and the way the "K" has performed.

Richmond, Va.

Richmond has found the A-C Model "U" tractor satisfactory for hauling refuse disposal trailers. They own four and each tractor pulls a train of three to four trailers.

For Your City

Allis-Chalmers recently introduced two new fuel oil-burning tractors, Models "K-O" and "L-O," which will operate at even less cost than the well-known gasoline models.

Besides fuel oil and gasoline tractors, both track-type and wheel-type, Allis-Chalmers manufactures Power-Controlled Graders; Hand-Controlled Graders; Speed Patrol Graders; Elevating Graders; Power Units of 40, 50, 60 and 90 Horsepower; Track-Type Wagons, Wagon Tracks; Road Discs and Plows. Let Allis-Chalmers equipment solve your problems. Write for further information.

ALLIS-CHALMERS
TRACTOR DIVISION—MILWAUKEE, U.S.A.

APRIL, 1934

Vol. XLIX, No. 4

The American City

470 Fourth Avenue
New York

35 Cents, $2 a Year

Population Trends and City Planning

By FREDERICK F. STEPHAN

Director, Bureau of Social Research, Federation of Social Agencies, Pittsburgh, Pa.

CITY planning faces both a challenge and an opportunity in the trends which are now evident in the populations of American cities. It is challenged to discard estimates of future growth based on the assumption that the rapid increase of the past will persist. It should adapt estimates and plans to the stationary and even decreasing populations which these trends predict for the near future. Its opportunity lies in the advantage of planning for a stable community of definite size and characteristics.

Briefly stated, the outstanding trends are a slowing-up of population growth, a rapid decline of the birth rate, diminishing numbers of children and of the foreign-born, decreasing family size, and a rapid increase of older adults. The very nature of these trends, involving as they do such basic factors as the birth, aging and death of individuals, warrants confidence that they will continue many years into the future.

A few charts, on this and the following page, may illustrate these trends. They are based on data for the population of Allegheny County, including Pittsburgh, Pa., but data showing similar trends may be found for most American cities and for the United States as a whole.* These trends may be examined and then their relation to city planning may be sketched.

Slackening of Population Growth

Chart I exhibits the slowing-down of population growth both in the actual numbers of individuals gained and in the percentage or rate of increase. Following 1945, there may be no further growth; by 1950, the period of decrease may be well started. While any great flow of migration either to or from the county would upset these expectations, there is little reason to expect such a movement of population.

For the last ten years or more immigration has been an insignificant factor in population growth. The diminishing percentage of the population that is foreign-born is shown in Chart II. Migrations of Negroes from the South have taken the place of immigration, in part, but they probably will not be resumed.

The principal source of the slackening of population growth is to be found in a declining birth rate. Apart from gains by migration and annexation, a city grows because it has a greater number of births than deaths. The excess represents natural increase. An increasing population would be expected to produce an increasing number of births, but the decline of the birth rate has been sufficiently rapid to offset the expected increase and actually to diminish the number of infants born in recent years. The number of deaths, on the other hand, has been ab-

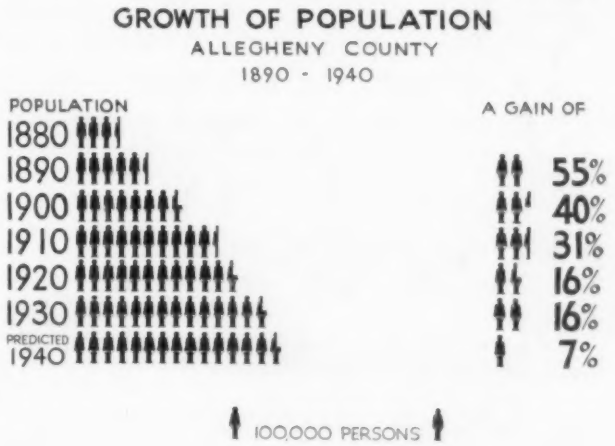


CHART I

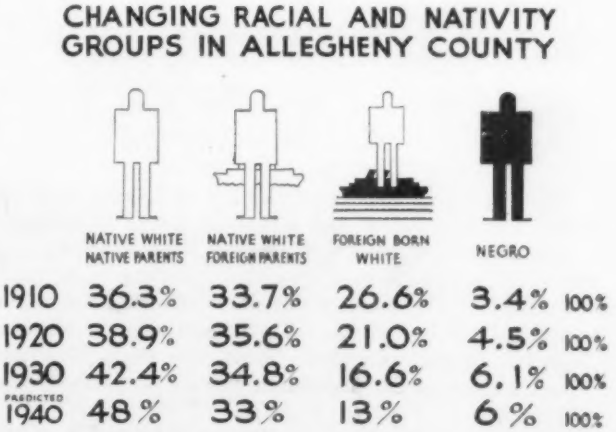

CHANGING RACIAL AND NATIVITY GROUPS IN ALLEGHENY COUNTY
NATIVE WHITE NATIVE PARENTS
NATIVE WHITE FOREIGN PARENTS
FOREIGN BORN WHITE
NEGRO
1910 36.3% 33.7% 26.6% 3.4% 100%
1920 38.9% 35.6% 21.0% 4.5% 100%
1930 42.4% 34.8% 16.6% 6.1% 100%
PREDICTED
1940 48% 33% 13% 6% 100%

CHART II

*For the United States, consult Warren S. Thompson and P. K. Whelpton, "Population Trends in the United States," (McGraw-Hill Publishing Co., Inc., New York).

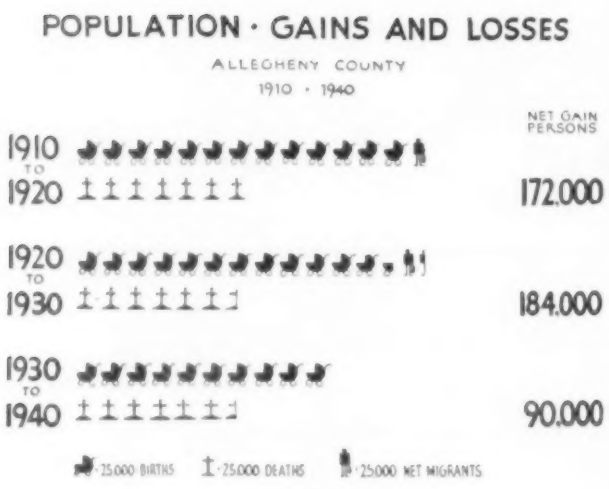


CHART III

normally low and cannot decline further with the decline of births. Consequently the excess of births over deaths is becoming smaller and may soon become a deficiency. Chart III shows, for ten-year periods, the gross gains from births, the gross losses by death, and net gains by migration. Even though an excess of births is shown for the period from 1930 to 1940, the total number of births is not adequate to meet "sinking-fund requirements" against the eventual deaths of the population of child-bearing age.

More Wives but Fewer Babies

The decline of birth rates—more wives but fewer babies—is shown by Chart IV. The figures given for 1940 are estimated by projecting the trend with allowance for the effect of the depression on the rate for 1933.

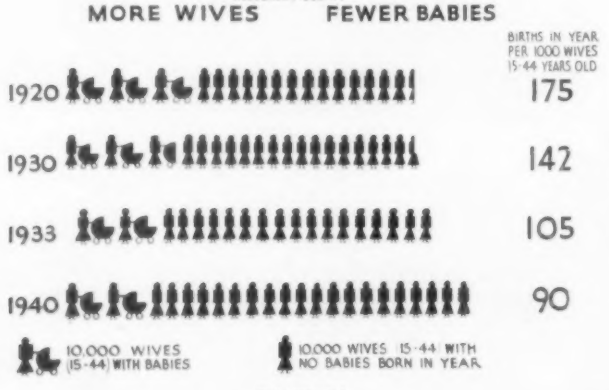

DECLINING BIRTH RATE
ALLEGHENY COUNTY
MORE WIVES FEWER BABIES
BIRTHS IN YEAR PER 1000 WIVES 15-44 YEARS OLD
1920 175
1930 142
1933 105
1940 90
10,000 WIVES 15-44 WITH BABIES
10,000 WIVES 15-44 WITH NO BABIES BORN IN YEAR

CHART IV

The decline in the actual number of infants born already has been reflected in a decrease in the child population under 10 years of age. Chart V shows this age group diminishing in both numbers and proportions in the total population. The adult population, reflecting high birth rates and immigration in the past, continues to increase, especially at the older ages. Twenty-five years from now about a third of the population will be 45 years of age or older.

Families are becoming smaller, on the average. Consequently the number of households will increase somewhat, even in a stationary population. The peak of births occurred between 1915 and 1917 in Allegheny County. The survivors of the children born in these years are just now approaching the age period in which most persons marry, as Chart VI indicates. Many marriages have been postponed by the depression, and the next few years of recovery should see the peak of the formation of new family groups.

Population trends are not the only influences affecting community development. Certainly the purchasing power of various groups and classes is a highly important factor. Much of the effect of population trends is contingent upon economic developments. However, several broad relationships may be sketched even in the absence of definite information on the economic future.

How Planning May Be Affected

First, it is clear that urban growth will slow down. This in itself should be an advantage for planning. Ex-

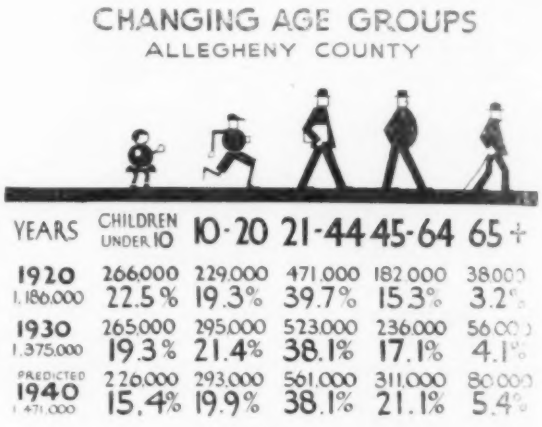


CHART V

pansion of the suburban ring will be slower but probably just as irregular as ever, unless it is controlled by adequate zoning and planning. Land speculation in anticipation of expansion will be dampened and land values in general may be held to a lower level by the lessening of the demands for residential and even commercial sites. This may reduce assessed valuations and taxes available for public improvements, but it should also facilitate the acquisition of property for such improvements. Property

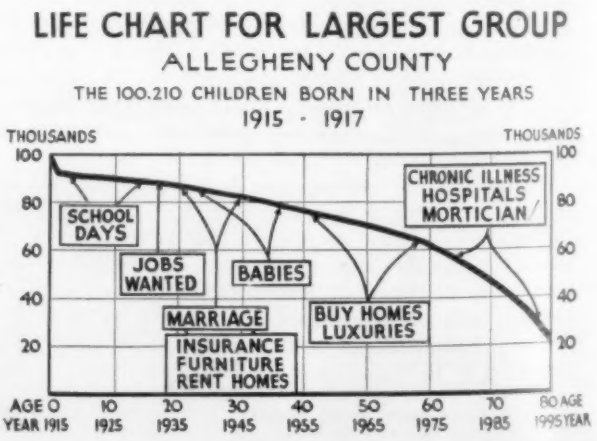


CHART VI

held in anticipation of the expansion of business districts may be reclaimed for residential and civic uses. Greater emphasis will be placed on replanning built-up districts than on coordinating new developments with the master plan.

Second, the child population will diminish, with the result that schools and playgrounds now inadequate, may become adequate, at least in size, in many neighborhoods. On the other hand, there will be increasing demand for parks and athletic fields suitable for adult recreation. Passive forms of recreation appealing to older adults will be needed in increasing number and variety. Increased adult leisure will contribute to the demand.

Third, it is highly probable that a considerable portion of the population over 45 years of age will be unable to secure employment in private industry even in prosperous years. The community will have to choose between outright relief or public works employment as a means of taking care of this group and it will have considerable reason to make the latter choice for able-bodied men. This will make possible a great amount of progress on city beautification, park improvement, and many other phases of the city plan.

Finally, these population trends will emphasize the need for intelligent planning of community development in all its phases—physical, political, economic, social—and city planning will find numerous opportunities to tie in with other planning movements in the interest of well-ordered community life.

Collecting Taxes by the Campaign Method

By WADE S. SMITH
National Municipal League

LITTLE more than a year ago tax strikes were being hailed as the latest manifestation of the old American doctrine of "no taxation without representation," and the renaissance of local government was seen as an immediate and more or less bitter struggle, with the taxpaying public on one side and its elected officials on the other. Today the struggle continues, but the preconceived division seems pretty well smashed. Throughout the country, citizens and officials are lining up side by side and aiming their shots not at each other but at the erstwhile tax striker, who is now referred to as the "tax slacker." Economy is still the watchword, but "Pay Your Taxes" campaigns in hundreds of cities have changed the emphasis to include a program for "getting" as well as for "spending."

Efforts to cordinate these scattered campaigns were made late last summer, when the National Pay Your Taxes Campaign was organized. Directed by the National Municipal League as part of the program of the Citizens' Councils for Constructive Economy movement, an educational campaign enlisting press, radio, and magazine support was begun. Information on campaign procedure was collected and distributed to waiting officials and citizens. Recently the League issued a manual for use in local campaigns, outlining the procedures found effective in dozens of cities. Improved economic conditions in some sections have not made any less imperative the concerted action of municipal administrators, if government is to continue hand in hand with recovery.

Beaumont—Dayton—Newark—Trenton

Among the earliest drives for the collection of delinquent taxes was that in Beaumont, Texas, last June and July. This campaign was sponsored and directed by a men's service club, at the invitation of the city administration. High-powered publicity was used to urge delinquents to pay up before penalties became effective. Some $210,000 was collected and the campaign was instrumental in demonstrating to the residents of the city the part played in their lives by the services supplied by their local government.

In Dayton, Ohio, a citizens' committee directed a tax collection drive, using a large group of volunteer workers who made a house-to-house canvass and individually interviewed delinquents. The campaign was organized along lines similar to those of a Red Cross roll call, or a community chest drive. Though the cash collections were not large, only between $300,000 and $500,000 being directly attributable to the campaign, the effort averted a threatening tax strike and greatly improved the city's morale.

During the latter part of September, city officials of Newark, N. J., organized their own tax collection campaign and, under the slogan "Dont' Let Newark Down," secured pledges from nearly half the delinquents to pay in periods ranging up to sixty months. The campaign was expertly organized, and rapidly became a model towards which other officials looked.* Trenton followed shortly behind her sister city, collecting nearly $3,000,000 in a joint citizen-official campaign which made much of an appeal to employers to assist worthy employees in meeting tax arrears.

Dallas—Houston—Memphis—Denver

Officials of the city of Dallas, Texas, convinced that "the collection of taxes is a continuous operation that should be followed in a manner similar to the operation of the credit department of a department store," employed a comprehensive follow-up and advertising system which resulted in a collection of 83.5 per cent of the 1932 taxes and a sharp paring down of accrued delinquencies during 1933. Phone, radio, and newspaper appeals were used, as well as notices by letter and post-card.

Another drive in Texas, in the city of Houston, resulted in the collection of 32 per cent of the unpaid 1931 taxes and 20 per cent of those of 1932, in addition to speeding current collections. Tacoma, Wash., collected nearly $2,000,000 in a campaign ending December 1, and hoped to secure nearly a million more under legislation expiring March 31.

In the city of Memphis, Tenn., officials put on a public-

*See THE AMERICAN CITY, December, 1933, for Revenue Director Reginald Parnell's story.

ity drive and offered special terms to delinquents. They collected 74.11 per cent of the 1933 levy, against an anticipated collection of 75 per cent, and received nearly half the arrears for 1932, plus delinquent taxes from other years. The director of revenue in Denver extended the scope of his departmental activities and collected some $500,000 in tax arrears, as compared with a normal collection of about $100,000 from this source.

Results in Other Cities

In a host of other cities officers tightened up in an effort to make sure that none of the collectible taxes were allowed to remain in default. A number of cities started so-called "tax clubs," similar in plan and operation to the well-known Christmas clubs, following the examples of Portsmouth, Va., Highland Park, Mich., and Stratford, Conn. Some cities undertook to reform their tax collection procedure, as did Kalamazoo, Mich., while others expanded the activities of other than the finance departments to help in meeting the emergency. Thus Louisville, Ky., assigned an attorney from the City Solicitor's office to tax work, and in the past two years secured $170,000 through his efforts.

And so it goes. Some cities which have been conducting surveys of the tax delinquency situation are now laying plans for campaigns to collect from those individuals who seem to have no valid reason for non-payment. An example is Toledo, Ohio, which found in a "sample" of half a million dollars' worth of arrears that taxpayers with bills of $1,000 and over owed 55 per cent of the total, while the "little fellow" with a bill of less than $100 owed less than 3 per cent of the total. Cleveland, long undecided as to its approach, is now finishing up an analysis of delinquents and organizing a citizens' committee to direct the campaign. A new administration in Boston, backed by various citizens' groups, is considering a campaign to realize on part of the $25,000,000 arrears outstanding. In hundreds of smaller centers, school board members, heads of chambers of commerce, civic associations, administrative officials, research agencies, and just plain citizens, are gathering their forces for a Pay Your Taxes Campaign. None deceive themselves that tax collection drives are a cure-all, but they are convinced that such procedure will materially lighten the financial load in the present time of stress, and that citizen interest awakened in the campaigns will not soon fade.

Suggested Projects for Work Divisions

ON March 20 the Federal Emergency Relief Administration outlined to State Emergency Relief Administrations six fields of suggested activity for the newly created "Work Divisions," which are replacing the CWA in cities of over 5,000 population and in defined industrial areas.* These suggestions, with the tentative percentage distribution of workers for each, follow:

A. Planning (3%)

Planning projects shall be designed and used as a guide for approval of projects in all the fields listed below, where satisfactory surveys and plans for this purpose are not already available.

Employing engineers, statisticians, economists, architects, industrial engineers and planners, home planners, interviewers, field and office workers.

B. Public Property (30%)

(Projects in this field must not include street cleaning, garbage collection, park maintenance and such items as are normally provided for in the local government budgets.)

Improvement and construction of city, state, and national parks, game or fish grounds and preserves, swimming pools, or other recreational facilities. Reforestation, landscaping, erosion control and similar projects.

Improvement and extension of water works, sewer systems, grade crossings, limited highway and street work, municipal power lines and power plants, airports, street signs and house numbering.

Improvement of publicly owned buildings such as schools, auditoriums, community houses, city halls, and institutions.

Eradication and control of disease bearers, pests and poisonous plants.

Employing engineers, technicians, young untrained workers, skilled and common labor, landscape gardeners, foresters, seamen, laboratory assistants, entomologists and assistants.

C. Housing (15%)

Remodeling and repair of houses in lieu of rent for relief families. Demolition of useless or condemned structures. Assistance in publicly owned housing. Resettlement housing for resettled families and subsistence homesteads.

This housing program is subject to extension.

Employing engineers, architects, decorators and landscape gardeners, skilled and common labor.

D. Production and Distribution of Goods Needed by the Unemployed (15%)

The production of goods for persons in need, such as clothing, food, household furnishings, and garden produce. Where it is advantageous, the Federal Surplus Relief Corporation will continue to be used to buy or exchange supplies and products. (This falls into two types of management: (a) direct operation by Work Divisions, and (b) cooperative and self-help associations.)

Employing skilled and common labor, factory, textile and clothing workers, industrial engineers, and trained production and business people.

E. Public Welfare, Health and Recreation (7%)

Public welfare work, nursing, nutritional and other public health programs, public recreation, traffic and safety controls and campaigns.

(Projects supplying service to private hospitals, private clinics and other non-governmental institutions cannot be approved. Persons employed in these services shall not replace or be employed in substitution for regular personnel.)

Employing public welfare and relief workers, nurses, doctors, dentists, and other welfare and health workers, playground and recreational directors, safety and traffic engineers, office workers.

F. Public Education, Arts and Research (10%)

Emergency activities in all the following: specialized fields of education, such as adult, pre-school, handicapped, workers, etc.; musical and dramatic activities, public works of art, library and museum extension, community information centers, scientific, economic, and social research done in cooperation with or coordination by established governmental agencies in any field which broadens human knowledge, develops pure science, or makes available for action present scientific, economic, or social information.

(Projects supplying service to private schools, private libraries, and other non-governmental institutions cannot be approved.)

Employing teachers, writers, musicians, artists, actors, library workers, information, and similar specialists, scientists, technical people, research workers, architects, engineers, statisticians, economists, planning specialists, clerks, stenographers, office workers.

Twenty per cent of the total workers are left undistributed to call attention to the fact that these percentage distributions are tentative and intended only to suggest the emphasis to be given to each field of activity, but not as definite limits.

Demolition of Useless Buildings Stressed

Uniform procedure to expedite a nation-wide program of tearing down useless buildings as an activity of the new Work Division of the F.E.R.A. was developed on March 23 at a conference in Washington. Attending the meeting were Federal representatives, city officials, labor executives, housewreckers, and others interested in housing.

Suggestion was made by Jacob Baker, Assistant Federal Emergency Relief Administrator, that:

"Some of the biggest opportunities before us today are in the field of housing. Scarcely half of all the people in the United States have housing that comes up to minimum standards of health and decency. . . . We have called this conference to consider one phase of the general problem: Demolition. . . . We happen to be in advantageous position to expedite removal of useless and insanitary buildings. We have manpower available. We know that by using this labor to remove eyesores, fire-traps and disease-ridden slum dwellings, we improve our towns and cities at once. It is highly desirable tht our spring house-cleaning program this year should include a widespread municipal house-cleaning of this larger sort. . . ."

* See page 7 of this issue.

Sewage Clarification at Rockville Centre, N. Y.

Vacuum Filtration Produces Satisfactory Effluent

VACUUM filtration as a means for sewage treatment has been used for the first time at Rockville Centre, Long Island, N. Y., as a direct outcome of the necessity for an exceptionally high degree of clarification.

Rockville Centre is a high-class suburban residential community situated just beyond the New York City limits. Its growth has been rapid, from 13,000 in 1930 to 18,000 in 1933, with an increase in sewage flow from 1.25 to peaks as high as 3.0 mgd. A sewage treatment plant was built in 1929 consisting of primary settling tanks, aeration tanks for the activated sludge process and secondary settling tanks, together with sludge digestion facilities and glass-covered sludge drying beds. Only a small watercourse was available, and it was not deemed desirable to discharge the plant effluent into it; consequently an extensive area of percolation beds was prepared for disposal into the underground waters. When the sewage volume treated was not in excess of the working capacity of the plant, the effluent was of high quality. It carried suspended solids, in the form of pin-point flocs, as is normal in effluent from an aeration plant. With an increase in the sewage flow far in excess of the optimum working capacity of the plant, the suspended matter discharged by the effluent greatly increased. An unbearable burden was placed upon the percolation beds. The labor and cost of operating these beds made maintenance impracticable, and unfavorable sanitary conditions threatened.

Rockville Centre was faced with a most difficult problem. Enlargement of the existing activated sludge plant was not desirable. Sufficient area for percolation beds was not available to meet future requirements. The Board of Sewer Commissioners studied the possibility of clarifying the effluent to such degree that direct discharge, after chlorination, could be made into the small watercourse, thus eliminating the use of the percolation beds. These studies and investigations convinced the Board of the practicability of vacuum filtration, and upon its recommendation the Board of Trustees of the village authorized the work, and William Gavin Taylor, a consulting engineer, was engaged to prepare plans and specifications.

The plan provided for three fundamental features: that the effluent from the aeration plant be subjected to mechanical vacuum filtration so that a very minute amount of suspended solids be carried in the filtrate regardless of the irregularities of that plant; that the effluent from existing primary settling tanks be stripped, by filtration, of a large percentage of its suspended solids as a preparatory process preceding aeration; and that the sewage solids deposited in the primary tanks, together with the excess sludge resulting from aeration, be dewatered by filtration as a process preparatory to incineration.

Vacuum Filter Installation

The new sewage filtration plant contains three revolving continuous vacuum filters, each having a capacity of

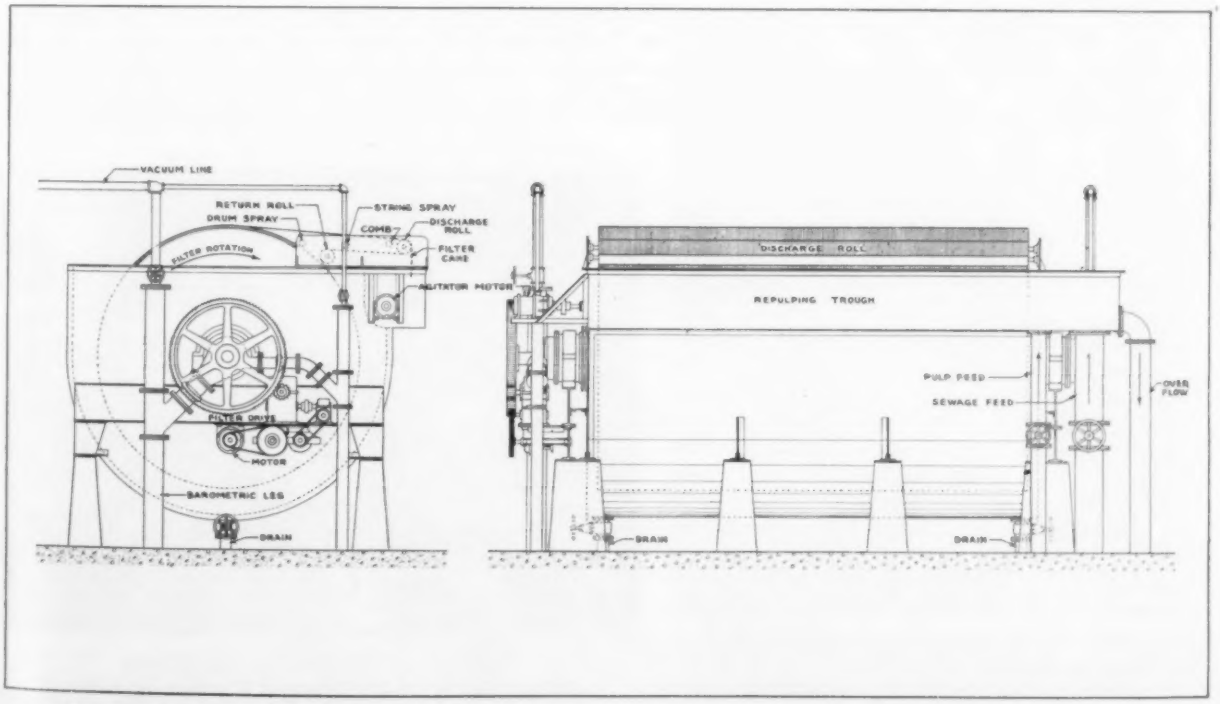
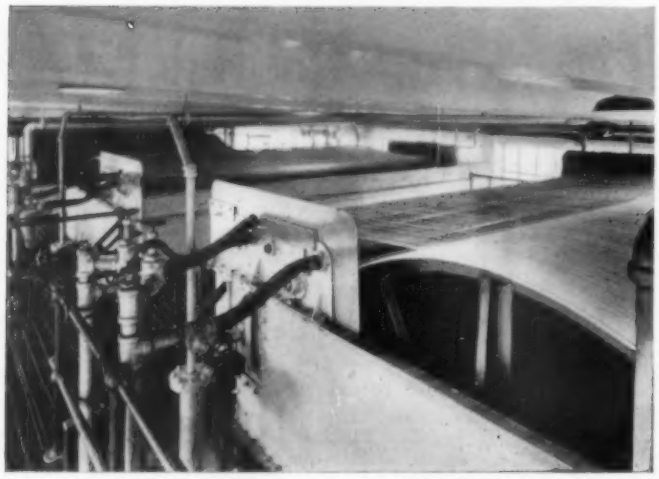


DIAGRAM OF THE VACUUM FILTER INSTALLATION FOR SEWAGE CLARIFICATION



LOOKING OVER THE TOP OF THE THREE FILTERS
The unit in the foreground is idle, the center unit is filtering sewage, and the far unit is dewatering sludge

3 mgd. Each unit is equipped with a drum 10 feet in diameter by 16 feet long, having slightly over 500 square feet of filtering area, each square foot of which is rated at 4 gallons per minute. Two units are constructed for operation at 70 per cent submergence and are devoted to the exclusive duty of filtering the effluent from the activated sludge plant. The third unit is constructed for double duty, that of filtering the settled effluent from the old primary tanks and dewatering the sludges. It can be operated at 60 per cent submergence when filtering sewage, or at 25 per cent submergence when dewatering sludge. All filters are of the "string discharge type" enabling them to operate at points of high submergence, so that the repulped filter cake can be directly returned to the sewage and in turn to the filter pan by gravity.

The two effluent clarifying filters utilize mats composed of paper pulp, and it is through this medium that actual filtration takes place. The filter drum itself is a heavy steel shell with recessed heads which serve to enclose the drainage channels from the 30 separate filtering compartments on the outside surface. The drainage area on the outside of the steel drum is formed by heavy bronze drainage wire covered with 14 mesh bronze screen wire. Over this is placed a cloth which can best be described as a good grade of cheese-cloth. It is on this cloth that the pulp mat is formed, the cloth acting only as a base.

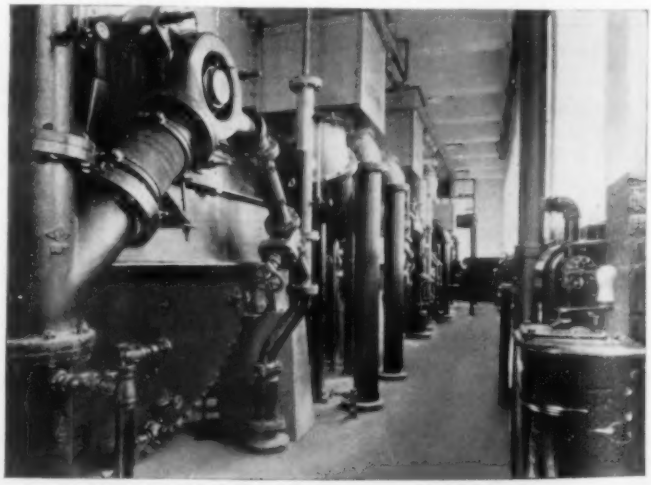
In placing one of the units in operation, about 700 pounds (dry basis) of paper pulp is pumped from one of the pulp pits to the filter pan. The filter drum is then operated, rotating at a speed of about one-third of a revolution per minute. Sewage is then admitted to the re-pulping trough, from which it flows by gravity into the filter pan. After a few revolutions a vacuum is automatically created due to the flow of filtered water through the barometric leg, and in turn a cake formation takes place on the surface of the drum, which permits continuous operation thereafter. As the drum revolves, the pulp filter mat is removed at the highest point on the drum by means of the string discharge and is then allowed to fall into the re-pulping trough where it is again thrown into suspension for re-use and allowed to mix with the incoming sewage prior to its passage into the filter pan. Thus the pulp mat is continuously and automatically removed with each revolution, making it possible to use a single charge of pulp from two to five days. A small amount of make-up pulp is required from time to time to replenish the fines which are removed in the washing or reclamation step described further on. The total pulp used, however, will still remain well within 400 pounds (dry basis) per million gallons of sewage so treated.

Refiltration of Cloudy Filtrate

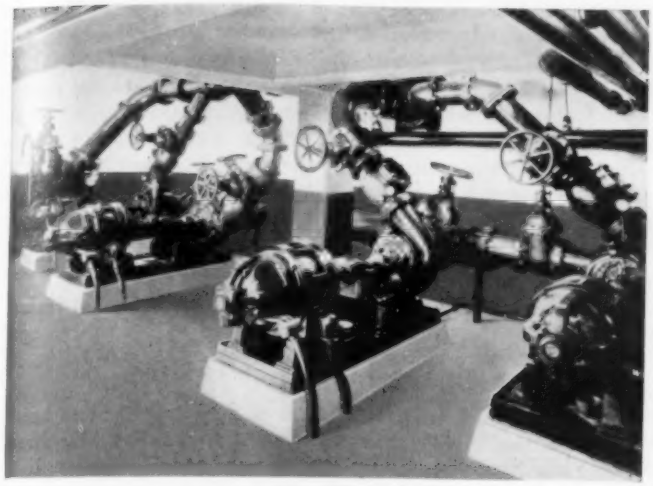
At Rockville Centre, where the very highest degree of treatment is required, a further refinement is made by separating the first surge which takes place with each revolution when the clean cloth, without its pulp mat, is first submerged in the sewage contained in the pan. This liquid is identified as "cloudy filtrate," and is returned for re-filtration. The amount of cloudy liquid can be varied to suit particular requirements, but it rarely exceeds 10 per cent of the total volume filtered. By this practice it is possible to automatically filter all liquids through the paper pulp mat and maintain an extremely high degree of clarity at all times. The process resembles the laboratory practice of filtering through a funnel equipped with filter paper.

The vacuum produced by the barometric legs depends upon the length and proper diameters of the legs. In this plant it is possible to produce vacuum equivalent to 13 inches of mercury, although this is a little high for the point of greatest filter efficiency. However, a vacuum of 5 to 8 inches gives highly favorable working conditions and can be easily maintained. The vacuum in the cloudy barometric leg is usually about 1 inch greater to prevent any possible mixture of the two due to possible slight leakage through the compartments in the valves. In many cases these refinements need not be included, since the high degree of clarity required at Rockville Centre will not be necessary.

Each filter is driven by a 3-hp motor, although the



LOOKING AT THE ENDS OF THE FILTERS
The pipe line in the left foreground is one of the barometric legs discharging filtered effluent. Pump, filter and other controls are shown along the wall at the right



A VIEW OF THE PUMP ROOM
The two pumps in the foreground deliver effluent to the clarifying filters, while those in the background deliver settled sewage and sludge to the combination unit

actual power consumed during operation is less than 2 hp. The re-pulpers are also driven by 3-hp motors with a reasonable factor of safety. The total, therefore, is about 5 hp per unit. Variable speed drives are used which offer 9 different drum speeds, varying from 1/3 rpm to 1 rpm. Each filter is provided with overflow weirs to safeguard against flooding, and liquid passing over these weirs returns to the influent wet well. In addition, each unit has drain valves which permit dumping the entire contents of the filter pans for cleaning purposes.

The combination filter, which is known as No. 3 unit, is the same size as the units used for filtering effluent, except that it operates at a point of 60 per cent submergence. When sludge is being dewatered on this unit, the barometric leg is cut off by means of a valve and a vacuum equivalent to 28 inches of mercury is produced by means of the vacuum pump. The filtrate drawn from the sludge is withdrawn against this vacuum by means of two filtrate pumps located in the basement of the building. The sludge cake discharged from the filter varies from 3/16-inch to 3/8-inch in thickness, and drops directly from a large receiving bin equipped with three large gates for the direct loading of trucks, which in turn convey the waste cake to the local garbage and rubbish incinerator.

The vacuum pump is used only at times of dewatering sludge. It is a 24-inch diameter by 10-inch stroke machine operating at 270 rpm, and is capable of displacing 1,408 cubic feet of air per minute. The motor which is used to drive this unit is 50 hp in size, although only 14 hp is consumed in maintaining a vacuum of 28 inches.

The filtrate pumps used during the sludge dewatering operation are self-priming LaBour units having 2½-inch suction and 2½-inch discharge connections. These pumps are capable of drawing liquid against the vacuum produced by the vacuum pump. The capacity of each is 150 gallons per minute, and each is driven by a 5-hp motor.

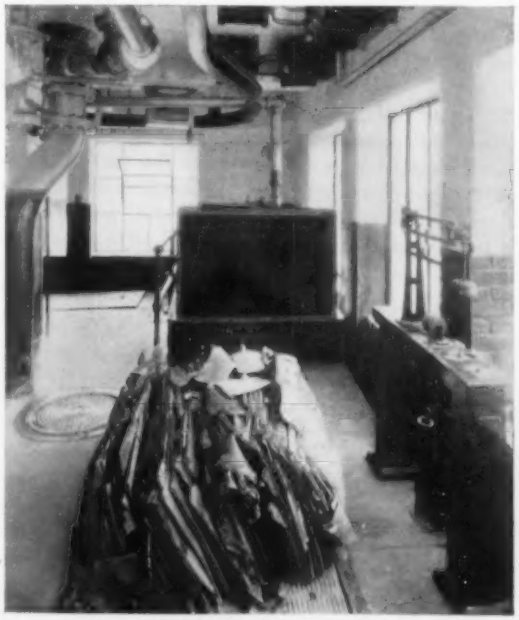
Pumping Installation

As the filters are located on the second floor of the filter building, it is necessary to pump sewage to the units. For this purpose, two non-clogging centrifugal pumps were installed, one having a normal rating of 2 mgd and the other rated at 3 mgd. The former is an 8 x 8-inch pump driven by a 20-hp motor, while the latter is 10 x 8 inches and driven by a 30-hp motor. The motors are of the slip-ring type for variable speed operation, the highest speed of either unit being 1,150 rpm. The speed controllers for these pumps are located on the filter floor for convenience.

Two other pumping units, exact duplicates of the above, were installed for the purpose of delivering settled sewage from the primary tanks to the combination filter. It is possible to filter all or a portion of this fresh settled sewage to bring about more uniform conditions in the aeration tanks by reducing the amount of suspended solids. This may play a very important part in effecting economies in the operation of the old plant, since the raw sewage entering the plant contains suspended solids varying from 50 to 1,000 ppm. The latter condition is entirely due to the fact that a certain amount of settling takes place in the wet wells of the pumping stations located in other parts of the village, and when the level in these wells is lowered, the accumulated solids are delivered to the treatment plant. This set of pumps is also controlled from the filter floor in the same manner as those used for pumping the activated sludge effluent to the clarifying filters.

Paper Pulping

The paper pulp mat or filtering medium used on the filters is produced by shredding old waste paper which is collected in the local garbage and rubbish incinerator plant and then delivered in bales to the new filter building. This material consists of the usual run of newspapers, magazines and corrugated cartons. Shredding is done through a 20 x 12-inch hammer-mill running at a speed of 1,750 rpm and driven by a 25-hp squirrel-cage motor. During the period of shredding water is used to facilitate proper pulping. The capacity of the machine



LOOKING TOWARD THE PAPER SHREDDER IN THE PAPER ROOM
The scale and a bale of waste paper as received from the municipal incinerator are shown in the foreground

is 1,000 pounds of dry paper per hour. Were it necessary only to shred paper to produce sufficient pulp to operate the clarifying filters, all of the pulp required for the daily operation could be produced in less than one hour.

The shredded material in the form of pulp drops directly into either or both of the two pulp storage pits located in the basement of the building. Each pit is capable of storing pulp equivalent to 1,200 pounds of dry paper at a consistency of approximately 3 per cent. Each pit is provided with a horizontal shaft agitator, traveling at a speed of 8 rpm and driven by a 5-hp motor. These agitators are used only at times of shredding and when pulp is withdrawn from the pit.

Two non-clogging pulp pumps are used to deliver pulp from the pits to the filters. These units have 4-inch suction and 4-inch discharge connections, operating at a speed of 1,150 rpm, and are driven by 7½-hp motors which are remotely controlled from three different locations.

A specially designed pulp washer is located in the space at the end of the garage. The washer serves in a dual capacity: that of washing pulp obtained from newspapers, to free it of ink and other foreign substances, and of washing old pulp, after a period of operation in the filter, to reclaim it for further use by freeing it of accumulated sewage solids. The washings from this unit are returned to the inlet of the old primary tanks and are permitted to settle as sludge, which is eventually handled on the sludge-dewatering unit. By this practice it is possible to use the initial pulp charge in a filter without interrupting its operation for periods of from two to five days, with resultant economy.

Chemical Treatment

A separate room is provided for feeding lime to either the sewage or the sludge as it enters the filter building. A continuous dry feeder having a capacity of 100 pounds of hydrated lime per hour is used for the purpose. In actual operation it has been found that lime feed is necessary only at times when sludge is dewatered, or to correct the pH of settled sewage from the primary tanks prior to filtration and subsequent aeration.

Another small room is provided for the chlorine machines and the storage of 10 or 12 small cylinders of chlorine. Two automatic chlorinators of 150 pounds capacity have been installed, so that both the settled sewage from the old primary tanks and the final filtered effluent as it leaves the building may be chlorinated as desired.

Results Attained

The results attained by the filters have not yet been published, but preliminary data, based on six months of continuous operation, can be given. During that time standard analyses were made daily for suspended solids, dissolved oxygen, B.O.D., pH, etc. In general, it has been found that the effluent from the activated sludge plant varies in suspended solids from about 10 ppm under the most favorable conditions of operation to as high as 500 ppm when bulking takes place. The normal average, over these six months, for suspended solids in the effluent is approximately 40 ppm. It is the duty of the new vacuum filters to remove this suspended material. Filter operation has shown that a filtrate containing less than 5 ppm can be consistently maintained, and that with careful operation results as low as 1 ppm can be accomplished.

The B.O.D. (five-day) of the effluent from the old plant is lowered by the extraction of suspended solids. Although the demand of the effluent leaving the old plant averages approximately 20 ppm, this is reduced by filtration and chlorination to 5 ppm or less. The chlorine dose is governed by residual chlorine in the filtrate, and the application of 2 ppm will give a residual of 0.3 ppm after a ten-minute period of contact.

The pH of the raw sewage entering the old plant varies from 6.0 to 6.5, but this is increased to 7.0 by passage through the activated sludge process. After filtration it will range between 7.0 to 7.2.

Bacteriological examinations of the filtered effluent have been made daily during a five-month period by the New York State Department of Health and show very low bacterial counts and a complete absence of organisms of the B. Coli group in 10-cc volumes tested.

Another interesting feature is the fact that the dissolved oxygen content of the liquid is greatly increased by passage through the filter. The liquid leaving the old plant and before filtering contains from 1.5 to 3.0 ppm. The same liquid after filtration contains from 6.0 to 8.0 ppm. This is undoubtedly due to the mixture of the air, which is pulled through the upper unsubmerged portion of the drum just before the point of cake discharge, with the filtrate as it descends the barometric legs which are used to create the vacuum required for the operation of the filter units.

Sludge Filtration

Sludge filtration has also been carried on for several months, and results clearly indicate that the fresh sewage solids from the old primary tanks can be mixed with excess activated sludge and readily dewatered. The means adopted for conditioning these sludge mixtures consist of the addition of a small amount of lime and paper pulp. The lime used is about 8 per cent of the weight of dry sewage solids, and the paper pulp, on a dry weight basis, is about 40 per cent of the weight of dry sewage solids filtered. The sludge cake as discharged from the filter contains from 68 to 75 per cent moisture.

The calorific content of this sludge cake is high, usually between 7,000 to 8,000 Btu per pound, dry weight basis. This cake is burned in the village garbage incinerator. Although it cannot be charged directly onto the burning grates of this type of furnace, the operators at the incinerator have found it possible to drop it into the combustion chamber, where during the course of the day it is destroyed. No clinkers are formed and the ash is in the form of powder and dust. The temperature in this combustion chamber varies between 1200 and 1500 degrees Fahrenheit. No odor has been noticeable as the result of this practice, and it does not appear to have reduced the burning rate of garbage and rubbish.

Costs

The new filter plant, with its normal rating of 3 mgd, represents an investment of approximately $125,000, which is equivalent to $42,000 per mgd of normal capacity. The original activated sludge plant, rated at 2 mgd, was built in 1929 at a cost of approximately $421,000, equivalent to

$210,500 per mgd of total capacity. The latter figure includes complete sludge digestion and gas collection facilities, as well as the cost of the percolation beds, which cover a large area. Heretofore these beds were required to dispose of the effluent from the plant, but they have been abandoned through the use of the new filter plant which permits the plant effluent to be discharged into Parsonage Creek.

The operating costs are now being definitely determined, as normal or routine operation has only recently been established. Sufficient data are at hand, however, to indicate that the filtration of sewage effluent from the old plant requires less than 200 pounds of paper; 300 kwhrs of electric energy, the greater part of which is used to pump sewage; and 10 man-hours of labor, per million gallons of sewage treated. The dewatering of fresh and excess activated sludge produced by the old plant accounts for a large part of the daily cost of the filter plant operation. In this operation about 1,000 pounds of paper are used; 450 kwhrs of electric energy; 200 pounds of lime; and 16 man-hours of labor, per day.

Maintenance items such as filter cloth and string replacements on the filters, oil, grease, etc., represent approximately $3.00 per day of operation, which includes both sewage filtration and sludge dewatering.

The contracts for the filter plant were awarded in January, 1933, by the Board of Sewer Commissioners after approval by the Board of Trustees of the village.

ACKNOWLEDGMENT.—The illustrations are used by courtesy of Municipal Sanitary Service Corporation.

Sanitation of Swimming Pools and Bathing Places in New Jersey

NEW JERSEY has been investigating swimming pools and bathing places throughout the state in a survey carried on by three officers of the State Department of Health,* who summarized their work in a paper read at the annual conference of state and local health officers held in Trenton February 16, 1934, and reported in *Public Health News* for February, from which the following information is abstracted.

There are now on record about 560 bathing places in the state, exclusive of the beaches along the ocean and most of its tidal tributaries. The maximum bathing load on these inland waters under favorable atmospheric conditions is considerably more than one-half million people; some of the highly developed centers draw their patronage from areas of 30-mile radius. These bathing places are classified as indoor pools, outdoor artificial pools, semi-artificial, semi-natural, and natural.

The *semi-artificial* type is rapidly growing in popularity and offers more problems in operation than the other types. The bottom or sides of a stream or other natural body of water may have been altered to make the site more suitable for bathing, and in every case the source of supply is a natural body of water, either intermittently or continuously polluted, and demanding constant supervision by persons versed in sanitation. The writers of the report believe that such pools should maintain the same bacteriological standard as outdoor artificial pools, out of fairness to the public and to the owners of competing pools, and that it is economically possible to install treatment devices and processes to accomplish this.

The *semi-natural* fresh water swimming and bathing places include those formed by damming a stream or natural basin to impound the water, originally as storage supplies for power plants or for ice ponds; in several cases becoming esthetic and recreational centers of real estate developments for people who wish to get away from city life. There is no systematic treatment of the water in such bathing places, because quantity, and not quality, is of interest to the power-plant owners, and because the size and irregularity of these lakes and ponds, and the currents set up by wind and temperature, make the possibility of any treatment very remote. Consequently, the only way to insure a satisfactory water is by preventing polluting material from entering any of the tributary streams.

The *natural* bathing places include all those located on bodies of water not created by man, in which the natural flow or circulation is not altered by artificial means; even though bulkheads or retaining walls may have been constructed to prevent the natural corrosion of the banks.

In this study the *artificial* pools are divided into three classes— recirculating, continuous flow, and "fill and draw." The recirculating pools are primarily those which are equipped with pumps to take water from one part of the pool and discharge it into another to produce a constant circulation throughout the pool. From a sanitary point of view this motion of the water adds nothing to its quality, although it is a common belief that moving water has some occult power for purifying itself. In no pool in New Jersey is the same water reintroduced without some treatment: five of the outdoor artificial pools just chlorinate the water before it is returned; one outdoor and seven indoor pools regularly filter and intermittently apply chlorine solution to the pool proper; and the remainder—twenty-five outdoor artificial and forty indoor pools—continuously filter (with or without coagulants) and sterilize the water before it is returned to the pool. Of the 70 recirculating pools from which samples were collected, only 5 pools showed coli organisms present in more than 30 per cent of the 10 cc portions examined, and only one of these pools was equipped to apply chlorine continuously.

Continuous flow is adaptable only where a large quantity of water is available for the pool. The water flows by gravity or is pumped into one part of the pool and drawn out at some other point, in order to maintain continuous circulation. Fourteen of the 34 New Jersey pools of this type neither filter nor sterilize the water, and of the 18 pools from which samples were obtained, only 6 showed coli organisms present in no more than 30 per cent of the 10 cc portions examined.

There are 21 outdoor artificial and 17 indoor pools in New Jersey still operating on the bathtub principle—complete removal and replacement of the water at periodic intervals; 17 of these do not attempt to treat the water between changes, and 21 apply hypochlorite solution or powder at more or less frequent intervals.

Only 7 of the 26 semi-artificial pools employ any means of treatment, although in every case treatment is both possible and economically feasible.

Should the pools in the larger bathing places that draw patronage from points 30 miles or more distant, and from several municipalities, be governed by the regulations of the place in which they are situated, by the regulations of the places from which the patronage is derived, or by regulations adopted by a central authority? The answer which the New Jersey State Department of Health gives to this question is shown in the formulation of the bill that there should be minimum rules and regulations adopted by the State Department of Health, to be carried out jointly by the Department and the local health officials. This would allow those municipalities that are provided with the necessary equipment to continue their present procedure, and would also protect the citizens of other places where no provisions have been made.

* D. M. Ditmars, Assistant Sanitary Engineer; H. C. Greenfield, Assistant Chemist; and L. W. Klockner, Watershed Inspector.

Billboards and the Supreme Court

Highest Tribunal Again Recognizes Right to Regulate Billboards Under Police Power

By ALBERT S. BARD

THE opinion of the United States Supreme Court, written by Justice Roberts, in the famous New York Milk Law case (*Nebbia v. New York*), decided March 5, 1934 (291 U. S. p. . .), upholding the power of the state to fix milk prices through a Milk Control Board, cites by way of illustration a number of businesses subjected to regulation and restriction under the police power.

Among such illustrations, billboards are expressly included, indeed are the first of the several illustrations cited. To quote Justice Roberts:

"The Court has repeatedly sustained curtailment of enjoyment of private property, in the public interest. The owner's rights may be subordinated to the needs of other private owners whose pursuits are vital to the paramount interests of the community.

"The state may control the use of property in various ways; may prohibit advertising billboards except of a prescribed size and location, or their use for certain kinds of advertising; may in certain circumstances authorize encroachments by party walls in cities; may fix the height of buildings, the character of materials, and methods of construction, the adjoining area which must be left open, and may exclude from residential sections offensive trades, industries and structures likely injuriously to affect the public health or safety; or may establish zones within which certain types of buildings or businesses are permitted and others excluded."

The claim of the outdoor advertising men that they are beyond control by the police power of the states because of the clauses in the United States Constitution forbidding the states to deny "equal protection of the laws" or "due process of law," and because they are in private business, has been judicially dead for some time under previous decisions. Now the Supreme Court of the United States, by its dictum above quoted, drives another cheerful nail into the coffin.

The decision in the milk control case has, of course, far wider implications, and will prove a landmark in the evolution of the law adjusting public and private interests. It is already claimed to throw light upon what the Supreme Court will do with NRA code cases. No doubt the decision goes a step beyond previous cases and is a recognition of the growing necessity of public control of private business under modern conditions. It says in effect that a *laissez faire* policy, justifiable under earlier conditions, must give way and that private business must accept more and more public regulation as times change, and as and when the legislative power recognizes the need for change and so decrees. That the case is an advance in the doctrine of public control over private interests is emphasized by the fact that this is a five to four decision, nearly half the Court refusing to follow the lead of the majority.

The wider implications of the case are illustrated by the following additional excerpts from Justice Roberts's opinion:

"Under our form of government the use of property and the making of contracts are normally matters of private and not of public concern. The general rule is that both shall be free of governmental interference. But neither property rights nor contract rights are absolute; for government cannot exist if the citizen may at will use his property to the detriment of his fellows, or exercise his freedom of contract to work them harm. Equally fundamental with the private right is that of the public to regulate it in the common interest. . . .

"The Constitution does not guarantee the unrestricted privilege to engage in a business or to conduct it as one pleases. Certain kinds of business may be prohibited; and the right to conduct a business, or to pursue a calling, may be conditional. Regulation of a business to prevent waste of the state's resources may be justified. And statutes prescribing the terms upon which those conducting certain businesses may contract, or imposing terms if they do enter into agreements, are within the state's competency. . . .

"Many other decisions show that the private character of a business does not necessarily remove it from the realm of regulation of charges or prices. The usury laws fix the price which may be exacted for the use of money, although no business more essentially private in character can be imagined than that of loaning one's personal funds. (*Griffith v. Connecticut*, 218 U. S. 563.) [Various other illustrations are cited.] . . .

"It is clear that there is no closed class or category of businesses affected with a public interest, and the function of courts in the application of the Fifth and Fourteenth Amendments is to determine in each case whether circumstances vindicate the challenged regulation as a reasonable exertion of governmental authority or condemn it as arbitrary or discriminatory. . . .

"The Constitution does not secure to any one liberty to conduct his business in such fashion as to inflict injury upon the public at large, or upon any substantial group of the people.

"Price control, like any other form of regulation, is unconstitutional only if arbitrary, discriminatory, or demonstrably irrelevant to the policy the Legislature is free to adopt, and hence an unnecessary and unwarranted interference with individual liberty."

Under these concepts of the police power and of the paramountcy of the public interest, a vigorous application of such power to the prevention of rural ribbon slums would soon lead to an amelioration of present roadside conditions.

Supreme Court Permits City to Tax Competing Utility

THE city of Seattle, Wash., on March 19 was rendered a decision by the U. S. Supreme Court, upholding its right to levy a 3 per cent tax on the gross income of the Puget Sound Power & Light Co., with which the city competes in furnishing electric light and power service.

It was claimed by the utility corporation that, since no such tax was levied on the municipal plant in Seattle, its imposition on the private company violated the equal protection, due process and contract impairment clauses of the Constitution.

Justice Stone, writing the majority opinion, swept this contention aside:

"It is enough for present purposes that the equal protection clause does not forbid discrimination with respect to things that are different.

"The private corporation, whatever its public duties, carries its business for private profit and is subject to the obligation common to all to contribute to the expense of government by paying taxes.

"The municipality, which is enabled to function only because it is a tax-gatherer, may acquire property or conduct a business in the interest of the public welfare, and its gains, if any, must be used for public ends.

"Hence equal protection does not require a city to abstain from taxing the business of a corporation organized for profit merely because in the public interest the municipality has acquired like property or conducts a like business."

The New Municipal Electric Plant at Bath, New York

Old Steam Plant Now Supplemented by Diesel Installation

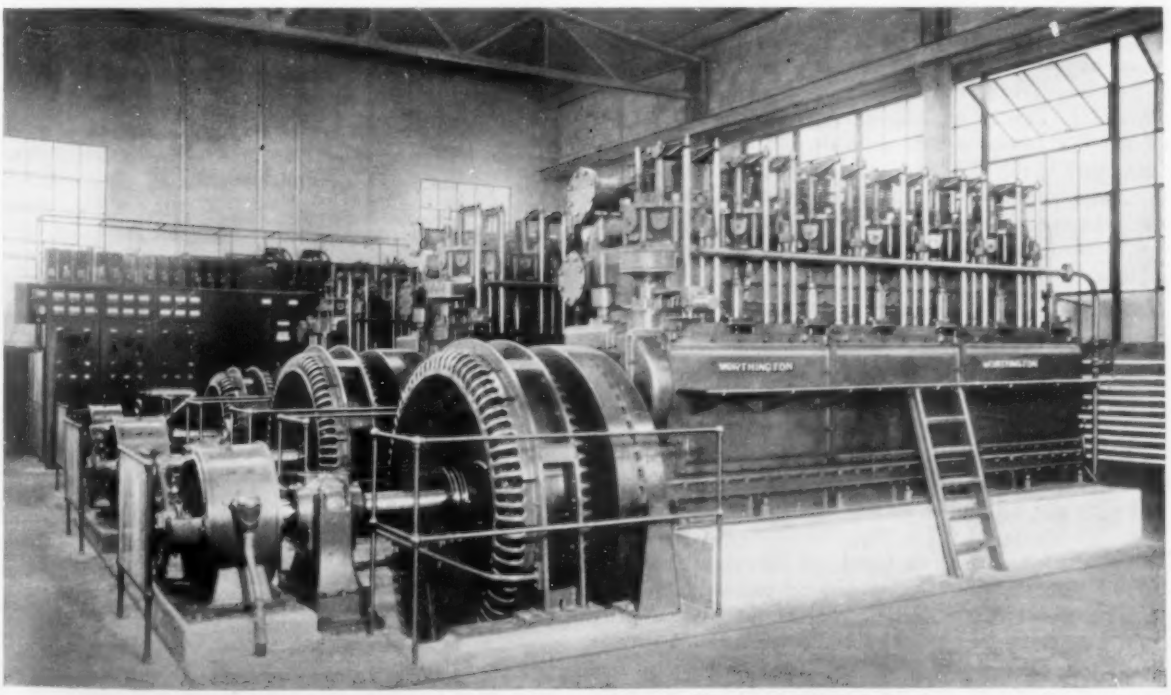
THE first shovelful of earth for the construction of the new modern electric light and power plant for Bath, N. Y., was removed from the building site on July 20, 1933, and the foundations and building were completed on October 20, just three months later. The new power-plant building, which is constructed of light-colored cinder blocks, is 35 feet wide and 60 feet long, and stands north of the old steam plant. The old and new buildings are connected by the pump house for the new plant, which is 17 by 18 feet in plan. The main building presents an attractive appearance. It is of steel frame construction with cinder block walls and steel roof. The windows, which form a large part of the walls on three sides, are of steel sash equipped with ribbed and wire glass. The entire structure is fireproof, the only wood being in the doors.

This main building houses the three new Worthington diesel engine units which supply power for generating the current and the new switchboard. Underneath the switchboard is a basement which contains the regulating rheostats and transformers. The three pumps which circulate water for cooling the engines are located in the pump house between the old and new buildings, as are the air compressor for starting the diesel engine, the oil-purifying centrifuge, and three tanks in which the compressed air for starting the engine is stored. The engines are cooled by soft water which circulates through them, and the soft water is in turn cooled by hard water. One pump circulates the soft water, the second forces the hard water through the cooling tower located at the rear of the old plant building and then over the soft water cooling coils, and the third pump is piped for both soft and hard water and may be used in place of either of the other pumps in emergency. There is also a connection for the village water supply, which could be used to cool the engines if all three pumps should fail.

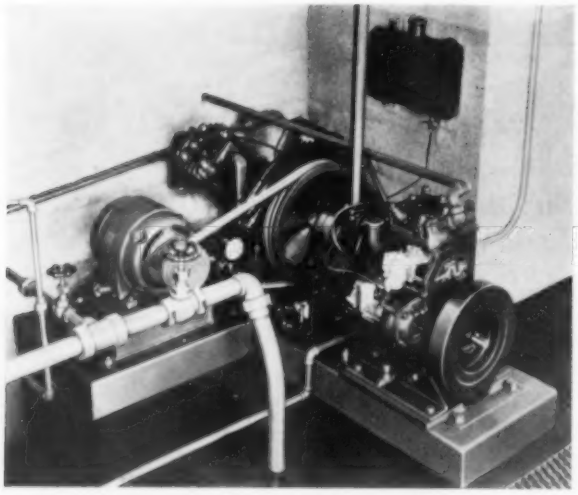
An overhead traveling crane runs on tracks which extend the entire length of the building, to be used for handling the engine pistons and other heavy machine parts when necessary.

It is interesting to note that the combined weight of the three diesel engines is little more than 80 tons, and the concrete foundations on which they rest weigh 322 tons. The engines, which are similar in appearance and performance to large, valve-in-head automobile engines, stand almost twice as high as the average man, and the three are capable of delivering a total of 1,200 horsepower. They are so well balanced, however, that there is no appreciable vibration of the building.

Fuel oil for the engines is pumped from railroad tank cars to the two storage tanks, each holding 12,500 gallons,



THREE WORTHINGTON DIESEL ENGINES IN THE BATH, N. Y., POWER PLANT



WORTHINGTON TWO-STAGE ANGLE TYPE AIR COMPRESSORS ON DIESEL ENGINE STARTING SERVICE IN THE BATH, N. Y., POWER PLANT

which are located at the rear of the electric plant property and well away from the building. From these storage tanks, the oil is pumped to the day operating tank in the engine room—one tank for each engine. Each tank holds 150 gallons of fuel oil, enough to run each of the large engines six hours or the small engine eight hours. Each tank is fitted with a gage, so that the fuel consumption of any engine can be determined at a glance.

The Switchboard

The switchboard, which runs across the east or front end of the room, is complete in every detail and is designed primarily for safety, with only the necessary controls and meters on the front of the board, and all high tension apparatus on a special framework some distance back of the board, with plenty of room provided to work on it.

Each engine and generator set has its panel on the board, as does each feeder circuit, and blank panels have been provided to handle an additional engine and generator and another feeder circuit as desired. The switchboard is connected to the lines outside which carry power through the village streets by cables running through iron conduits to a "wire-tower" on the roof of the building. The lightning arrestors are located on the wire tower outside the building.

Fuel Costs Much Lower

Data on operating costs gathered through observations taken during tests of the new machines show the substantial saving in production costs. At the present time the cost of fuel oil is 5.31 cents per gallon delivered. The average number of kilowatt-hours produced per gallon of fuel oil consumed by the engines is 11.7, which means that one kwhr costs 4.53 mills, or less than half a cent, for fuel alone.

In producing current to equal the output of the plant for 1933, or 1,739,580 kwhrs, the saving on fuel alone when compared to the cost of coal at the present price would amount to $11,255.08 for the year. Even greater savings may become apparent later, for it is believed that after a few weeks of use the engines will show increased economy of operation, and with an increased load, or demand for power, the plant will show a much greater saving.

To the fuel costs must be added the cost of labor, lubricating oil and miscellaneous expenses, but with a liberal allowance for these costs indications are that the current can continue to be produced on the switchboard in the Bath plant for 1 cent per kilowatt-hour or less. The average cost of producing current in the steam plant for the 10 years from 1923 to 1932 was 2.95 cents per kilowatt-hour.

TABLE SHOWING GROWTH OF BATH PLANT

FROM 1923 TO 1932 INCLUSIVE

Year	Kwhrs Generated at the Switchboard	Kwhrs Used in Station	Peak Load Kw	Operating Expenses for Current at Switchboard
1923.....	700,990	10,294	315	$27,742.89
1924.....	792,840	28,256	345	28,852.45
1925.....	974,220	27,786	405	28,794.16
1926.....	947,000	29,060	348	29,202.04
1927.....	1,027,400	31,764	370	31,937.73
1928.....	1,055,500	32,729	400	30,480.69
1929.....	1,195,500	46,195	475	29,225.01
1930.....	1,402,160	35,900	600	31,760.76
1931.....	1,660,450	34,742	620	35,695.88
1932.....	1,657,420	33,380	605	36,739.98

Owing to the depression, the output and load dropped off in 1932 as compared with 1931. The December peak load was 620 kw in 1931 and 605 in 1932. There was much less Christmas lighting in 1932.

The plant was designed by Willard E. Boileau, consulting engineer, and is operated by Frank Nollett, who has been superintendent of the gas and electric plant for more than 20 years.

Continuation of the Radio Program on Reviving Local Government

(Tuesday evenings, 7.15—7.45 Eastern Standard Time; beginning May 1, Eastern Daylight Saving Time; National Broadcasting Company's nation-wide network.)

April 10. State and Local Government in the Control of the Liquor Traffic
Albert L. Scott, Yandell Henderson, Luther Gulick

April 17. From the Heart of the Depression
Mayor Frank Couzens, Detroit
Arthur J. Lacy, Attorney
Prof. Arthur W. Bromage, University of Michigan

April 24. Local Government and the New Deal
Dr. William T. Foster, Consumers Advisory Board
Harold D. Smith, President, American Municipal Association

May 1. Suburban Troubles
Walter R. Darby, State Auditor, New Jersey
E. F. Dunstan, Chairman, Municipal Securities Committee, Investment Bankers Association of America
Arnold Frye, Attorney, New York

May 8. Chicago Over the Hump
John O. Rees, Secretary, Committee on Public Expenditures
Robert B. Upham, City Comptroller

May 15. Schools for Municipal Officials
Mayor J. Boyd Thacher, Albany, N. Y.
Albert H. Hall, Director, Bureau of Training, New York Conference of Mayors
Morton L. Wallerstein, Director, Virginia League of Municipalities

May 22. News from the South
Mayor J. Fulmer Bright, Richmond, Va.
Hon. William B. Harrison, former Mayor of Louisville, Ky.

May 29. The National Administration and Local Reorganization
George F. Milton, President and Editor, *The Chattanooga News*
Arnold Bennett Hall, Director, Institute for Government Research, Brookings Institution

June 5. The Schools in Local Revival
George F. Zook, United States Commissioner of Education
C. R. Mann, Director, American Council on Education

June 12. The Voter and Local Government Revival
Miss Katharine Ludington, Chairman, Finance Committee, National League of Women Voters
Frank R. Kent, Vice-President, *The Baltimore Sun*

June 19. What Are the Prospects?
Prof. Thomas H. Reed, Chairman, Committee on Citizens Councils for Constructive Economy
Frank H. Morse, Lehman Bros., New York
Howard P. Jones, Secretary, National Municipal League

A Study of Water Consumption and Metering
Part I

How Much Would Complete Metering of Water Service Save the City of Philadelphia?

IN any water-supply system it is important to keep water waste at a minimum. To the extent that waste can be prevented, operating costs can be kept down, enlargements of the water works can be postponed, and new structures, when built, can be of smaller capacity.

That water would be conserved by completing the metering of Philadelphia's partly metered services has been pointed out repeatedly in the last fifty years by commissions, officials, and civic bodies. It has been urged that substantial savings would result, and various estimates have been made of the probable effect on the city's water consumption, but the information on which these estimates were based has been far from adequate. All that was known of Philadelphia's experience with metering was the effect of partial metering upon the city's total consumption of water. If it had been known also what proportion of the water supplied through services was affected by this partial metering, it would have been possible to estimate with some degree of accuracy the probable effect of complete metering. This, however, was not known. In the first extensive installation of meters were included all the large users of water, so that it could not be assumed that the volume of water supplied through metered services bore the same proportion to the volume of water supplied through all services as the number of services metered bore to the total number of services. Only an actual computation of water consumption from meter readings could provide the information needed.

To obtain a more reliable estimate, the Bureau of Municipal Research of Philadelphia accordingly undertook in 1927 a computation of the consumption of water registered by consumers' meters. Abstracting and analyzing the necessary information from thousands of meter records was a herculean task. However, the work seemed justified, not only by the importance of more exact knowledge of the effect of metering, but also by the opportunity afforded by the study of obtaining valuable data on other aspects of the water-supply problem, namely, a schedule of fair charges for water, methods of reading meters and billing consumers, and maintenance of meters.

Methods of Study

The computation of metered-water consumption could be made most readily from the records kept by the Water-Assessment Division of the Department of Receiver of Taxes. Through the courtesy of the Receiver of Taxes, the Bureau was permitted to place workers in the Water-Assessment Division to abstract the needed information from the records. The work was begun in May, 1927, continued actively for about two years, and intermittently afterwards.

On specially mimeographed sheets the Bureau's copyists recorded for each meter the most recent readings, with their dates as nearly as possible a year apart. The meter size and the predominating use of the water were also noted. After consultation with the Chief of the Bureau of Water, a classification of water services according to use in general agreement with that commonly made was adopted. The classes are as follows:

Domestic.—Residences, apartment houses, and combined apartments and stores where the residential use predominates.

Industrial.—Manufacturing plants, laundries, dairies, garages, gasoline stations, utilities, railroads, stores and office buildings, hotels, and other enterprises for profit.

Institutional.—Charitable institutions, hospitals, denominational and other private schools, colleges and universities, churches, clubs, and other associations not operating for profit through the sale of goods or services.

Summary of Conclusions

The Bureau's findings on water consumption in Philadelphia and its estimate of the effect of universal metering on the city's requirements for water are given in detail in this report. They may be briefly summarized as follows:

1. ***The total output of the Philadelphia water works in 1927 was 125,983,400,000 gallons; in 1932 it was 111,337,500,000 gallons, a decrease of 14,645,900,000 gallons, or over 11 per cent.***
2. ***The quantity of water taken through meters in 1927 was 46,269,700,000 gallons, leaving 79,714,000,000 gallons to be accounted for in other ways.***
3. ***Of the 80 billion gallons (approximate), about 19 billion gallons may be accounted for as water used for municipal purposes; that is, for street cleaning, fire fighting, public swimming pools, public schools, city hospitals, and other municipal activities.***
4. ***About 16 billion gallons may be accounted for as water lost in the distribution system, through leaks and breakages of the water mains.***
5. ***There remain, then, 45 billion gallons as the quantity of water taken in 1927 through unmetered private services.***
6. ***From the Bureau's analysis it would appear that only 27 billion gallons would have been taken through the unmetered private services had they been metered, a saving of 18 billion gallons.***
7. ***Because there were fewer unmetered private services to take water in 1932 than in 1927, metering of the unmetered private services would have saved less water in 1932. The estimated saving is about 17 billion gallons.***
8. ***In 1927, complete metering would have reduced the per capita water consumption in Philadelphia from 180 gallons a day to 155 gallons a day, a reduction of about 14 per cent. In 1932 it would have reduced the per capita consumption from 154 gallons a day to 131 gallons a day, a reduction of 15 per cent.***
9. ***The saving in water that would result from complete metering would make possible a saving in operation and maintenance expenses of the water works of about $180,000 a year.***
10. ***Savings would arise also from the fact that less plant capacity for pumping and treatment would be needed.***
11. ***Smaller demands would be made on sources of water supply.***

A tabulation of the basic computations of water consumption and the results will be found in an appendix at the end of this report.

Municipal—Water used for street cleaning, fire fighting, public swimming pools, and the many other city activities, and for public buildings, including schools, hospitals, and other public institutions.

Underground Leakage.—Water lost by leakage and breaks in the distribution system.

Only the domestic, industrial, and institutional uses were obtainable with any degree of completeness from the account books. As bills are rendered for domestic and industrial consumption at the general rate and for institutional use at a special, low rate, the meters must be read and accounts must be maintained. No charge, however, either actual or as a matter of bookkeeping, was made for water used for municipal purposes; and the meters, where installed on public services, were not being read. In any event, the volume of water used for fire fighting, street cleaning, and like activities must be estimated, since there is no practical way to measure it.

For many properties the classification could not be obtained from the books of the Receiver of Taxes. Only two classifications are necessary for the billing of accounts: (1) institutions which receive the low charity rate, and (2) all others. Many properties, however, had been classified prior to January 1, 1927, when the meter reading was done and the accounts were kept by the Bureau of Water. The classification of properties for which the information was not available was secured from the records of the Board of Revision of Taxes and from actual field inspection of the properties. During the field inspections the classifications of the accounts could be checked, and it was found that they were, in general, sufficiently accurate for the purposes of the study.

As the meters are never all read at intervals of exactly the same length, the consumption between readings had to be converted into volumes for a uniform period. The year was selected, as it would cover seasonal variations, such as greater use of water in summer. When the meters read in gallons, the volumes were recomputed in cubic feet, the unit in which the large majority of Philadelphia meters register.

Limitations of Work and Meter-Reading Procedure

The rapidity and completeness of the work were limited by the conditions under which it had to be done. A brief description of the meter-reading procedure and the records will explain these conditions. Meters are read by the district water-meter inspectors of the Water-Assessment Division, Department of Receiver of Taxes. The readings are written on cards taken into the field, and a card is kept for each meter. For purposes of meter readings, the cards are sorted into routes. When the cards are returned by the inspectors, the readings are copied by hand into loose-leaf account books in which the meter accounts of each ward are arranged in alphabetical order by streets with house numbers in numerical order. To facilitate copying, the cards are sorted again into the order of the accounts. Loose-leaf books are used so that new accounts can be inserted or old ones removed as changes occur. The consumption shown by the readings is computed and entered with the amount of the bill, date of billing, and other accounting items. In addition there is recorded, for each meter, its make, manufacturer's number, type, size, size of ferrule, and date of installation. Other pertinent information on location of meter, its condition, record of removal for repairs, unusual usage of water, leaks, and the like may also be noted.

Under the conditions of meter reading and billing it saved time to take the meter readings from the cards or the accounts according as either was available. When the cards were in use, the readings were taken from the accounts, and vice versa. The figures of consumption in the accounts, however, could not be used because, as previously mentioned, they were for periods of different lengths and a uniform period of a year was desired. Toward the end of the work, it sometimes happened that both the cards and the account books of all the wards still remaining to be examined were in use by the Water-Assessment Division, so that it was necessary for the time being to suspend the examination of these records altogether.

Another limitation was placed on the work by the impossibility of getting readings in the same period for every meter. Readings could not always be made, and it was necessary to use the best information that was available. For example, a meter was sometimes found damaged or not registering at all, or coal or lumber was piled over it, or it could not be read because the pit in which it was located was full of water. There may have been no response to the meter reader's knock or ring, perhaps because the occupants were all away at work. Or it might be that the house was quarantined for infectious disease or was closed for the summer. Sometimes the continuity of recorded consumption was interrupted by removal of the meter for repair and, although the use of water continued, the meter was not there to record it. When it was returned, the dials might have been set to zero. As all small meters are normally read four times a year, some period could usually be found to give a year's consumption. It might be, of course, that a meter had been installed less than a year before the most recent readings were taken. If so, a year's registration was computed from the part of a year available. For meters of large size, the important ones, it was not usually necessary to shift the period more than a month or two, since these meters are read monthly in order to avoid errors which might occur when the registering dials have "gone around." There is a limit to the volume that each size of meter will register. Thus, a meter with a capacity of 10,000,000 cubic feet will register 9,999,999 and then zero. Unless it is known that the meter has gone around from its maximum registration to zero between readings an erroneous bill may be rendered.

Metered Consumption in 1927

The information secured in the manner and under the limitations just described, when added, yielded the total volume of water registered by the meters. However, meters commonly register less water than passes through them. It was necessary, in order to obtain the total metered consumption, to estimate the amount of unrecorded water.

Volume Registered by Meters

In the course of the study, the records of 141,488 meters were secured and, of these, 124,895 were domestic, 15,021 industrial, and 1,572 institutional. From the readings of the domestic meters, a total annual volume of 1,353,118,000 cubic feet was computed; the industrial meters registered a volume of 3,745,197,000 cubic feet; and the institutional meters recorded 375,842,000 cubic feet. The total for the three classes was 5,474,157,000 cubic feet a year, or 40,947,000,000 gallons.

Some of the meters showed no consumption because the

premises were vacant for all the period or the meters themselves were inoperative. In the latter event, an approximation of the consumption was obtained by using readings for an earlier period.

Meters in public buildings such as the schools were not included in the computations used because, although some of the schools and public buildings are metered, many are not; and the meters that are in the public buildings were not being read, so that the record was very incomplete. These consumptions, moreover, were properly a part of the municipal consumption, which in any event, must largely be estimated. Most of the meters on fire services were also omitted. If fire meters showed a consumption greater than the few cubic feet registered when fire pumps are "turned over" to see that they are in working order, the consumption was recorded; otherwise it was omitted. As no charge is made for water used for extinguishing fires, fire meters are read only to note any use of water through them for purposes other than fires. Some meters may also have been missed because, although the meters had been installed and were on the records of the Bureau of Water, the work of making out account sheets and putting them in the books had not been completed. It is believed, however, that the volume of metered water omitted in this way was insignificant.

Under-Registration of Meters

Under-registration of meters is due partly to wear and partly to the fact that small flows of water are less accurately recorded than large, or, if they are very small, not recorded at all. The standard specifications of the American Water Works Association allow an error of 2 per cent, but experience has shown that for a large number of meters in service this may be exceeded. As there is no routine procedure in Philadelphia for testing all meters regularly to maintain their accuracy, meters being tested only upon complaint or when the meter reader reports some obvious defect, the under-registration of meters in Philadelphia would be high rather than low. As a guide in determining how much the Philadelphia meters probably under-register, there are the findings of tests of meters 4 inches and over in size in Philadelphia as well as data of other cities. During a leakage survey of the city's distribution system which was just well under way in 1927, all meters 4 inches and over were tested and under-registration amounting to 4,722,000 gallons a day was found, a rate of 1,724 million gallons a year. In addition, there was under-registration of meters less than 4 inches in size, but the amount of this under-registration is not known.

Some indication of a reasonable assumption for the ratio between registration of meters and their under-registration can be gotten from the ratio indicated for meters 4 inches and over. Of the total of 141,488 meters, 470 were 4 inches and over and the registration of these meters was, in round numbers, 13 billion gallons. The ratio of 1,724 million gallons to 13 billion gallons is approximately 13 per cent.

That 13 per cent is a reasonable ratio to assume is indicated by figures of other cities. In Detroit, which is over 99 per cent metered, the water unaccounted for is 7 per cent of the pumpage and, as municipal use and losses in the distribution system are not included in this 7 per cent, it is largely explained by under-registration of meters. The total meter registration in Detroit is 79 per cent of the total output, and the ratio of under-registration to total registration is, therefore, about 9 per cent. A report of New Orleans for 1929 assumes that 20 per cent of the water taken through meters passed them unrecorded. New Orleans is completely metered. L. R. Howson gives, in the *Journal* of the American Water Works Association for September, 1928, the results of a study of water unaccounted for in 44 completely metered water systems throughout the United States. Of the water pumped by these plants, 73.5 per cent was registered by consumers' meters, the remaining 26.5 per cent representing water unaccounted for. As a result of his survey Mr. Howson states that for all practical purposes it is close enough to assume, as a general average, 40 per cent of the unaccounted-for water as chargeable to under-registration of meters. If 26.5 per cent of the water is unaccounted for and 40 per cent of this is due to under-registration, then 10.6 per cent of the output of the plants passes the meters without registration and the ratio of water unrecorded by meters to the total meter registration is 14 per cent.

Mr. Howson in the same article states that, in general, the figures which he secured would indicate that meters used on filtered waters will measure small flows somewhat more accurately than those measuring ground waters or unfiltered surface supplies. As the water supply of Philadelphia is filtered, there is reason to assume that the under-registration will not be extreme, because of the quality of the water, and this is supported by the 13 per cent computed for meters 4 inches and over. On the other hand, the lack of routine procedure for testing meters to maintain accuracy suggests a probability of more than a minimum. If 13 per cent is assumed as the ratio of meter under-registration to registration and applied to the total registration of 40,947 million gallons, 5,323 million gallons is the under-registration of meters.

Total Meter Consumption

Adding 5,323 million gallons to 40,947 million gallons gives 46,270 million gallons as the amount of water taken through meters in 1927. That the total is not unreasonable is indicated by a comparison of the consumption per metered service per day with similar consumptions in other cities computed from figures given in a table in "Water Works Practice," a manual of the American Water Works Association. For Philadelphia, the quantity is 896 gallons per metered service a day, obtained by reducing 46,270 million gallons a year to gallons a day and dividing by 141,488, the number of meters. From the table above mentioned, 769 gallons per metered service a day is computed for Detroit, 859 gallons per service a day for Cleveland, 1,091 for Baltimore, and 1,385 for New York. This comparison has little significance except to show that the result obtained for Philadelphia is not outside of all reason since consumptions per service are influenced by a number of conditions, not the least of which is the charge made for water.

Unmetered Private Consumption in 1927

It would seem that the purpose of the study, to ascertain the effect of complete metering, could now be readily accomplished since, with the metered consumption known, the unmetered consumption, which is the difference between it and the total output, can be computed. However, not all of the unmetered consumption would be affected by complete metering.

Total Unmetered Consumption

Since the 12-month periods for which the water consumptions of individual meters were computed for all but three wards were largely or partly in 1927, the total consumption of that year is taken for computing the unmetered consumption. In 1927 the output of the water works was, in round numbers, according to records of the Bureau of Water, 125,983 million gallons. The total metered-water consumption has been estimated at 46,270 million gallons. Subtracting the water taken by metered premises from the total leaves 79,713 million gallons, which is made up of water taken by unmetered, private premises, water used for municipal purposes, and water lost in the distribution system. The water taken by unmetered, private premises is the quantity desired. For the purposes of estimating, it will be within the limitations of accuracy to use 80 billion gallons for the total just mentioned.

Water Used for Municipal Purposes

An estimate can be made of the water used in city activities, and for this the records of other cities will be an aid. In an article by Ezra B. Whitman, in the *Journal* of the American Water Works Association for April, 1932, the "free water" for public, educational, and other institutions and for parks and the Boulevard in Chicago is estimated for the years 1920-25. The percentage is 6 for the first four years and 5 for the last two years. For three other cities, Baltimore, Fall River, and Lynchburg, the percentage ranged from 8 to 16, and Turneaure and Russell, in "Public Water Supplies," estimate the average in American cities as 10 per cent. In the annual report of the Board of Water Commissioners of Detroit for the year ending June 30, 1930, the total municipal use, metered and unmetered, is given as 10.98 per cent. New Orleans, which presents a detailed analysis of water consumption in its report for 1929, shows 7 per cent for metered free consumers including schools, hospitals, engine houses, libraries, police stations, and other municipal services; 0.6 per cent for sewer flushing; and 19 per cent for streets and drain flushing, street sprinkling, fires, other uses, waste through hydrants, and unauthorized uses. The total of these consumptions, almost all of which are municipal, is a little over 26 per cent.

In the foregoing, precentages ranging from 5 to 26, with an average of 10, have been noted. As many of the municipal services in Philadelphia are not metered and the meters on the others are not read to detect and stop waste, the percentage of waste in buildings is no doubt higher than in cities using these preventive measures. Furthermore, there is no routine service to control other municipal use. It is reasonable to assume that municipal use in Philadelphia will be higher than the 11 per cent of Detroit, where practically all services are metered. Three other cities for which figures are given had percentages of 8 to 16. These figures indicate that, as Philadelphia's percentage is probably more than Detroit's, it will be over 11 per cent and not more than 16. New Orleans reported 26 per cent, but this contained 19 per cent for street sprinkling, street flushing and other uses which, because of the southern location and other characteristics of the city, are probably greater than in Philadelphia. Furthermore, the average of American cities is placed at 10 per cent, which indicates that 26 per cent is unusually high, just as Chicago's 5 per cent is probably low and certainly incomplete as a measure of municipal use as defined in this study. The available information, therefore, considered with regard for the known conditions of municipal use prevailing in Philadelphia, suggests 15 per cent as a reasonable assumption. This gives 19 billion gallons in 1927. Substracting 19 billion gallons from 80 billion gallons leaves 61 billion gallons, which is made up of losses in the distribution system and the water taken by unmetered private premises.

EDITORIAL NOTE.—This article will be continued in the May issue, giving further data on: Losses in the Distribution System; Unmetered Private Consumption; and Consumption through Unmetered Services, If Metered. It is based on a report by Charles A. Howland, Staff Engineer, Bureau of Municipal Research of Philadelphia, issued in December, 1933.

Can a Progressive City Afford Part-Time Health Service?

THE same arguments which might be offered in favor of a 100 per cent police chief and fire chief apply with even more force to the health officer.

The training of a practitioner of medicine is not sufficient to qualify him to direct public health work. A health officer must, of course, be grounded in the fundamental art of medicine. However, the unit around which his intensive study centers is not the individual human machine but the body politic. His training includes an understanding of statesmanship, sanitary engineering, publicity, human relationships, and many other branches of science.

The health officer is also an educator. Public health has lately seen a shifting of emphasis from sanitation and mechanical devices for protection against disease to one for promoting individual health. The health officer is the channel through which medical science reaches the people. A private physician, steeped in the lore of medical ethics (which is good and proper) even when he serves as part-time health officer, can ill afford to place himself in the public spotlight.

The mere employment of an expert health administrator is not all that is needed, but it is the first and most important step. He must be backed by a public-spirited board of health answerable to the people, which will protect him from the wiles of crafty politicians. He must have a budget big enough to make his brains count. A per capita expenditure of from $1.00 to $2.00 per year is considered a fair amount according to present standards.

In a city where the health department is the football of politics or where a penny-pinching policy keeps the antiquatd system in force, your wife may die at childbirth because no one warned you how to prevent the toxemia of pregnancy; your baby may die of summer complaint because the milk-inspecting system was faulty; your daughter may be struck with diphtheria because there was no aggressive campaign for its prevention; your son may acquire a contagious disease because your neighbor broke quarantine; and you may be invalided by tuberculosis because a sleepy health department permitted a fellow-workman to infect you.

Are you interested in seeing that your community has a competent health department? You are!

—From an article by KENDALL EMERSON, M. D., Managing Director, National Tuberculosis Association.

Every community needs good schools, police and fire protection, well-kept roads and above all, a modern health department.

A POSTER USED IN THE NATIONAL TUBERCULOSIS ASSOCIATION'S CAMPAIGN FOR EFFICIENT HEALTH DEPARTMENTS

Savannah Builds Cement-Bound Macadam with Brickbat Aggregate

By A. S. GOEBEL
City Engineer,
Savannah, Ga.

THE city of Savannah, cooperating with the Civil Works Administration, is building cement-bound macadam pavement in which the coarse aggregate is vitrified paving brick, taken from the streets that are being paved, and broken by hand. In this way the cost of materials is kept within 30 per cent of the total cost of the job, and many more men are given employment than would have been used on an ordinary paving job.

The old brick streets that are being repaved have been in use about 30 years, and were built without a concrete foundation. Occasional service cuts for water, sewer and gas pipes, combined with the 30 years of travel, had made the surfaces too rough for modern traffic, and repaving has been needed for some time.

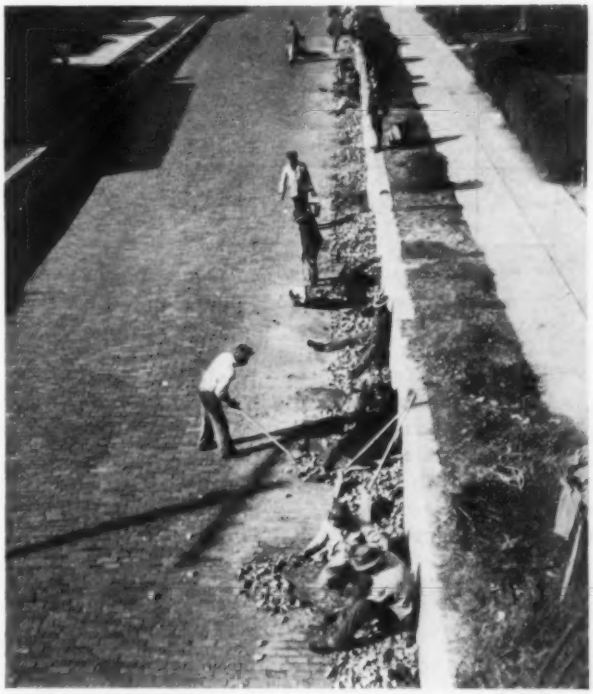
In seeking construction work that would require a maximum of labor with a small expenditure for materials, but which would be of permanent value, the city administration proposed cement-bound macadam pavement, and the proposal was accepted by the CWA.

Making the Aggregate

The pavement is built half at a time. The brick slab has sand-filled joints, so the bricks came up easily and do not require cleaning. They are removed from curb to center line on the side to be paved first, and are broken with hammers into roughly cubical fragments from 2 to 3½ inches in size. The broken brick are stored on the other half of the street until they are put in place on the subgrade.

The brick are 3½ by 2¾ by 8 inches in size and were laid with the 3½-inch edge vertical. There is very little waste, the broken pieces making a loose depth of coarse aggregate of 4½ inches. The additional thickness necessary is secured by crushed granite cast over the layer of broken brick. The granite thus serves as a wearing surface and, because a smaller size is used, makes it easier to get a smooth-riding surface.

The fine aggregate is a local sand dredged from the Savannah River. It is finer than concrete sand, nearly all of it passing a number 14 sieve, but is excellent for grout.

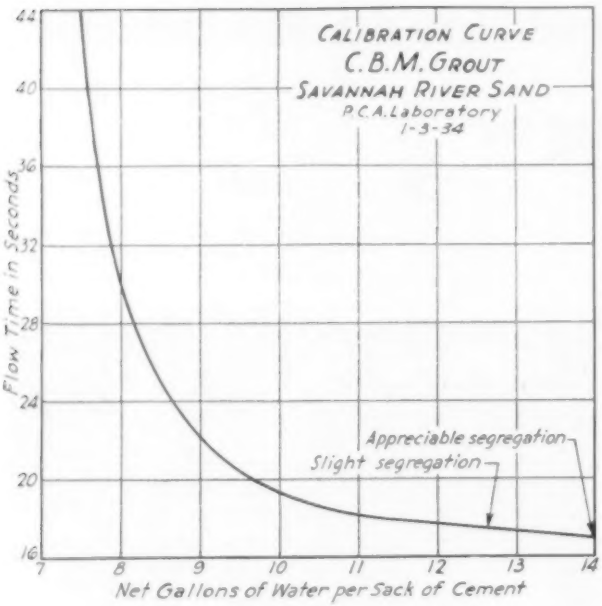


REMOVING AND BREAKING BRICK FOR AGGREGATE

Since the subgrade has been in its present position for many years, it is disturbed as little as possible in preparing it for the new slab. It is, however, brought to exact elevation and checked with a subgrade template. Wooden forms are used, one being set along the center line of the street, and the other against the curb. The latter is used

PROGRESSIVE STEPS IN COMPLETING THE NEW CEMENT-BOUND MACADAM PAVEMENT BY HAND LABOR IN SAVANNAH, GA.

1. Grout is carried from the mixer in wheelbarrows and dumped onto a board, from which it runs into the coarse aggregate. 2. Both before and after grouting the slab is compacted with a longitudinal hand tamp. 3. A section of completed cement-bound macadam on the left, with the right half of the slab, which was built last, still being cured with wet earth



only as a guide for templates and is removed as soon as the slab is grouted.

The coarse aggregate is carried into place on the subgrade with stone forks, which screen out any chips or dirt that have been thrown in with the coarser material.

After the coarse aggregate is in place, it is compacted with a hand tamp in the form of a template 12 feet long, 6 inches wide, and equipped with plow handles on each end. This is operated parallel to the center line by two men, who use considerable force in striking the coarse aggregate with it.

Grouting

Voids in the coarse aggregate are then filled with grout. The grout is proportioned 1:2 by weight, but the sand is measured in a cubic-foot box, the volume required to give the desired weight having been previously determined. Grout is mixed in 10-S mixers. Sand is brought to the mixer in wheelbarrows, and grout is also carried to its place in the pavement in wheelbarrows that run over planks laid on the coarse aggregate. To avoid disturbing the coarse aggregate, barrows are dumped onto a small board platform, laid on the coarse aggregate, from which the grout runs into the slab. This platform is always kept on the aggregate already grouted, so that the grout *runs into* the aggregate instead of being poured over it.

About 45 minutes after the slab is grouted, it is again tamped with a template like the one already described. The surface is then carefully checked with a straight-edge, and any inequalities are corrected, after which it is floated with long-handled floats, the edges are rounded, and a strip of wet burlap is dragged over the slab to give it the final finish. The pavement is cured with wet earth.

The proper consistency of grout is determined by noting the time required for the grout to discharge from a funnel of 221 cubic inches capacity. This funnel is especially designed for the purpose and has a machined nozzle ½-inch in diameter and 1½ inches long. Previous experiments have determined the time of flow which is needed for grout that is to fully penetrate coarse aggregate of different sizes. For the aggregate in use in Savannah the flow time should be about 23 seconds.

Before work was started, a calibration curve was made up for the grout, with the sand that was to be used and with different quantities of mixing water per sack of cement, beginning with 6 and running to 13 gallons. The flow times for each quantity of mixing water were then plotted and this curve was used to determine the amount of water that must be added at the mixer to secure the correct fluidity of grout. The calibration curve is shown in an accompanying diagram. More water is required to secure the desired flow than would be necessary with a coarser sand, but there is no tendency for the sand to settle from the grout until 13 gallons of water is used. With a coarser sand the point of segregation would be reached with much less mixing water.

It is desired that the least possible amount of mixing water be used, since dilution reduces strengths, and too wet a grout delays finishing. The curve indicates that 8¾ gallons per sack of cement are required to secure 23-second flow. It is better to have too fluid a grout (so long as the point of segregation is not passed) than one which is so stiff that it does not completely fill the voids. About half a gallon more water was therefore used than the curve indicates is necessary, so that small errors in measurement would not result in too stiff a grout.

Labor and Wages

Two mixers and two separate gangs are used. A gang of 100 men was required to remove and break brick, unload materials, place the coarse aggregate on the subgrade, and grout and finish the slab. Two shifts of men are used per day, one gang working from 7:00 A. M. until noon, the next from noon until 5 o'clock. No man is allowed to work more than 30 hours per week. In this way 400 men are given steady employment.

The wages are 40 cents per hour for common labor, so that each man can make $12 per week, which is ample for the simple standards of living of Southern laborers.

The community has thus been relieved of the increasingly difficult task of supplying "relief" to 400 men and their families, and in addition has, for a very small expenditure of its own funds, secured a substantial yardage of new pavement where it was badly needed.

To Prevent the Building of Potential Slums

"May we hope that out of the government's emergency action may come a realization by American business men not only that the slum is doomed, but that not much longer will American taxpayers stand for the building of *new potential slums*. The death knell of the speculator has been struck. Building or rebuilding, from this year our cities will demand for their citizens a new and better kind of living, economically more sound, socially more secure.

Of one thing we may be sure. A cloud is in the sky, the handwriting on the wall. Our cities are to be built and rebuilt in generations just ahead. If business does not build them, government will; and if government builds, business will foot the bill."

—From the article "Who Will Build and Rebuild Our Cities?" published in *Chatham Village News* for March 1, 1934.

Street Maintenance Programs for 1934

More Cities Report Plans for Rehabilitation of City Streets

In the January-March issues of THE AMERICAN CITY reports have been published from cities in different parts of the country showing their plans for street maintenance during the first six months of 1934. The survey has been continued and below are the plans of other cities.

Anderson, S. C.

The city of Anderson is preparing plans and specifications for 150,000 yards of light bituminous surfacing of the residential streets under a loan from the PWA.—F. R. SWEENEY, City Engineer.

Ansonia, Conn.

Street maintenance in Ansonia will consist of oiling, patching and minor repairs for the first six months of the year, and the oil will be furnished by the State Highway Department on the Town Aid Appropriation. The expenditure for maintenance will amount to about $12,000.—VINCENT B. CLARKE, City Engineer.

Arlington, Mass.

Surface treatment and drainage involving an expenditure of about $10,000 per month will be the street maintenance program for Arlington for the next six months.—JAMES M. KEANE, Town Engineer.

Ashland, Pa.

The borough of Ashland has received an allotment of $54,075.99 from the Civil Works Administration and is itself expending $9,684.85 on its street maintenance program, which includes the laying of 40,000 square yards of asphalt macadam, 12,139 square yards of cement-bound macadam and 3,000 feet of storm sewer. This work will involve the purchase of 80,000 gallons of asphalt, 12,000 bags of cement, and 1,000 tons of sand and crushed stone which will be obtained locally from a CWA project.—H. L. BURMEISTER, Borough Manager.

Auburn, Maine

Sealing approximately 60 miles of bituminous-treated gravel roads comprises the major maintenance program this year, at a cost of $28,200. Approximately 40 miles will be sealed with heavy viscosity tar, and the remainder with natural asphalt or emulsified asphalt where a stable mat has not already been acquired. Approximately 130,000 gallons of tar and asphalt are to be purchased.—M. O. HATCH, Assistant City Engineer.

Beloit, Kans.

Street maintenance in Beloit this year will consist of graveling approximately 3 miles of streets, shouldering up, and placing new culverts where needed. There will also be about 2,500 feet of cement-bound macadam constructed at an approximate expenditure of $7,500, and it will employ 50 men under the CWA. The purchases will include about $1,000 for local gravel and 12-, 16- and 18-inch Armco iron corrugated culverts and one car of cement.—R. C. HADLEY, City Engineer.

Berwick, Pa.

During the next six months about 1,000 feet of Seventh Street, Berwick, will be graded, and there will also be grading for sidewalks and other streets for a distance of about 1 mile. A retaining wall is to be built along the street, and it is planned to lay 5,000 feet of 42- to 60-inch sewer at a depth of from 5 to 24 feet. Although the estimates are not yet complete for this work, it is expected that the project will cost about $80,000. It is planned for CWA labor. The purchases will include 85 feet of 42-inch cast iron pipe, 85 feet of 12-inch cast iron pipe, 1,640 feet of 42-inch segment block pipe, 260 feet of 54-inch segment block pipe, 2,800 feet of 60-inch segment block sewer, brick for 15 manholes of an average height of 16 feet, castings for manhole tops, 16 inlet castings, 600 feet of 6-inch pipe, 200 feet of 12-inch vitrified clay pipe, 10,000 feet of lumber and the necessary hand tools.—BOYD PRESCOTT, City Engineer.

Boone, Iowa

Asphalt paving in Boone is to be repaired at a total expense of $1,000.—GEORGE A. NELSON, City Engineer.

Boonville, Mo.

The complete maintenance program in Boonville in the next six months will include some work on Fifth Street. The city also has a proposition of underdraining surface drainage involving an expenditure of about 20,000 and including the purchase of $10,000 of clay tile.—E. T. HALE, City Engineer.

Chester, S. C.

The sweeping of paved streets and reworking of the top soil and dirt streets, patching a few cuts in the pavements, and hauling top soil for the improvement of some roads at a total expense of $6,000 will constitute all of the maintenance in Chester this year. The purchases will include a few tons of Colprovia, a few bags of cement, and some hand street brooms.—J. H. MCLURE, City Engineer.

Chickasha, Okla.

The maintenance program in Chickasha calls for the refilling of expansion joints in the concrete pavement, patching old asphalt pavement, bridge and culvert repair work on wooden structures, and other small and usual maintenance work. The bulget for the current year has been cut to such a point that it does not allow more than bare necessities and includes only $750 for maintenance.—J. D. DU BOSE, City Engineer.

Concord, N. H.

Patching and tar treatment will compose Concord's entire street maintenance program for the next six months, during which about $30,000 will be expended for labor, using regular city forces, and for the purchase of 250,000 gallons of tar.—FRED W. LANG, Commissioner of Public Works.

Darien, Conn.

The town of Darien is carrying on an extensive maintenance program, including the sufacing of gravel roads, treating oil-surfaced roads, and pouring cracks and maintaining the shoulders on concrete roads, as well as cutting brush where needed, involving an expenditure of about $16,000. All maintenance work is done by the Darien Town Highway Department, composed of five men under the supervision of a foreman. The Superintendent of Highways and Bridges has charge of all highways, sidewalks and bridges in the town and is required to give technical advice and assistance to any other town department when so requested. He is also a member of the Town Plan and Zoning Commission. The Superintendent of Highways and Bridges is appointed for a term of three years and is free of political interference. He is solely responsible for the conduct of the department, which maintains 4.82 miles of cement concrete road, 1.62 miles of asphaltic roads, 6.54 miles of bituminous macadam roads, 22.56 miles of oiled surface roads, and 7.82 miles of gravel and earth roads. This year's maintenance program requires the purchase of 25,000 gallons of bituminous materials, about 600 cubic yards of sand for cover, culverts, catch-basin tops and small tools.—WALTER A. BATES, Superintendent, Department of Highways and Bridges.

Elyria, Ohio

In Elyria about 33,000 square yards of brick pavement is to be relaid as part of the street maintenance program, at an expense of about $95,000. This work is to be carried on only if approved as a CWA project. It will involve the purchase of new brick, bituminous filler and concrete materials. —J. M. Powell, City Engineer.

Enid, Okla.

Only the absolutely necessary maintenance will be performed on the streets of Enid this year. The street repair fund comes from penalties on delinquent taxes. The last Oklahoma Legislature passed a bill remitting all delinquent penalties, which deprived the city of its repair funds. There is some CWA work in progress at the present time on the streets.—C. H. Rightmore, Consulting City Engineer.

Fort Wayne, Ind.

During the coming season, Fort Wayne will grade about 30 miles of unpaved streets, repave about 20 miles of brick pavements, resurface 1½ miles of brick pavements and reset about 10 miles of curbing, at an anticipated cost of $60,000. A large portion of this sum depends upon the purchase of materials by property owners, and practically all of the work will be dependent upon CWA labor. The approximate quantities of materials to be bought include 950 cubic yards of concrete, 5,260 tons of asphalt surface, and 5,000 linear feet of drainage pipe.—Van A. Barnett, City Engineer.

Frackville, Pa.

The CWA has provided labor to pave approximately 42,000 square yards of Frackville's streets with macadam. This program will necessitate the purchase of 38,970 gallons of tar or asphalt. Crushed stone will be furnished by the CWA from a local crusher.—Thomas J. Lewis, City Engineer.

Freehold, N. J.

The application of approximately 30,000 gallons of surfacing material, asphaltic oil, tar and asphalt emulsion with CWA labor is planned as Freehold's maintenance program for the first half of 1934. About $3,000 will be spent for material.—Walter J. Schiverea, Borough Engineer.

Fresno, Calif.

In the coming six months the city of Fresno will use 5,000 barrels of asphaltic road oil for the oiling of streets recently brought to grade under the CWA program. A total of about $10,000 will be expended for this work. About $50,000 will have been spent when the present program, which was started in December, is completed. This work has been done by CWA workers, using city equipment for the breaking-up of the streets. Many miles of streets have been brought to grade, mostly in places where the cut was one foot or more. —Jean L. Vincenz, City Engineer.

Gary, Ind.

Approximately 100,000 square yards of street are to be resurfaced as part of Gary's maintenance program, at a cost of about $65,000. This money is returned to the city from the state gasoline tax fund. The work will involve the purchase of 12,000 tons of stone, 300 tons of rock asphalt and 120,000 gallons of tar.—John Hayes, City Engineer.

Geneva, Ill.

The only maintenance that will be necessary in Geneva is the yearly care of pavement cracks, for all the streets are in excellent condition. The sum of $1,000 has been set aside for this work.—E. Roy Wells, City Engineer.

Glendale, Calif.

An expenditure of about $15,000 for the usual street paving and maintenance will be carried on by the city of Glendale with city forces during the next six months. Application has been made to the CWA for the financing of a $352,300 program of street improvement, storm drains and bridges. —J. C. Albers, City Engineer.

Greenville, S. C.

The city of Greenville has asked the CWA for money to surface-treat about 5 miles of dirt streets, at a total cost of about $12,000.—Dan A. Hubst, City Engineer.

Hagerstown, Md.

Hagerstown will carry on and do the ordinary routine maintenance, but not on an elaborate scale, owing to the economies which the city is forced to apply in order to conserve its available funds to be diverted to CWA projects. The city is carrying on a rather extensive civil works program of street construction and other needy projects.—Samuel L. Greenawalt, City Engineer.

Hartford, Conn.

The routine maintenance of 20 miles of dirt streets and 120 miles of macadam and 55 miles of more permanent types of pavement will be carried on in Hartford during the coming season at an anticipated cost of $140,000. There will be no new equipment purchased but some sheet asphalt, crushed stone and Bitumuls will be purchased.—Leon F. Peck, Superintendent of Streets.

Honesdale, Pa.

The maintenance program in Honesdale for 1934 calls for resurfacing wherever necessary and the construction of about 3 miles of new roads, which are now under way as CWA projects. Some purchase of bituminous top dressing and chips for resurfacing and finishing the CWA project is to be made, and the total expenditure on the work will be between $5,000 and $6,000.—Julius Freund, City Engineer.

Indianapolis, Ind.

About $100,000 worth of street improvements in the form of resurfacing and $200,000 for the regular maintenance on asphalt and concrete streets, is planned for the next six months in Indianapolis. This work includes asphalt and concrete repairs and maintenance on macadam and unimproved streets. The city does not expect to purchase any equipment, but the necessary material for this work will be purchased either by the contractors or by the city.—A. H. Moore, City Civil Engineer.

Jackson, Ohio

No street program will be developed in Jackson until the CWA expires. Last year all maintenance work was handled by the city's purchasing material and using relief labor furnished by various agencies. It is expected that the same plan will be used this year, but at present everybody is working on CWA projects. The street maintenance expenditure will be about $10,000 for the year.—Arch E. Campbell, City Engineer.

Jacksonville, Fla.

The city of Jacksonville has no special maintenance program other than the ordinary more or less emergency maintenance necessary to keep things going. In the budget there is approximately $87,172 for labor and about $22,220 for materials for the entire year of 1934.—W. E. Sheddan, City Engineer.

Keokuk, Iowa

Although the street maintenance program for 1934 in Keokuk has not been completely worked out as yet, it will involve the relaying of several blocks of worn brick pavements, using the same paving brick. There will be, however, the usual small maintenance repair work, which varies from year to year.—C. J. Nelson, City Engineer.

Lancaster, Ohio

About $10,000 will be expended in Lancaster for the relaying of brick pavements and the surface treatment of gravel streets. This will involve the purchase of tar, brick, asphalt and sand.—Walter W. Graf, City Engineer.

Lewiston, Idaho

Lewiston is planning a very limited maintenance program for the next six months, consisting of a few hundred yards of crushed rock surfacing, blading of streets, and two or three miles of streets to be graded under the CWA program, amounting to approximately $20,000. It is also expected that three miles of streets will be oiled, necessitating the expenditure of $2,000 for oil.—W. P. Hughes, City Engineer.

Lodi, Calif.

A maintenance program to cost $12,116 has been planned in Lodi and includes the removal of damaged or uplifted curbs and gutters, sidewalks, and driveways within the city limits, the cutting-away of tree roots causing this damage, the removal of stumps of trees within the street and parking area, the replacement of such curbs and gutters, sidewalks and driveways where practical, and the rebuilding of the remaining sections. It is also contemplated to build corner sidewalk approaches from the existing sidewalks to the existing curbs, and to fill such parking areas as are hazardous to pedestrians using the sidewalks. It is further expected that certain stretches of sunken sidewalk and gutters will be filled with Calrock or like material to check further settling and afford drainage. This work is to be done under the Civil Works Administration for San Joaquin County, the labor and equipment items being obtained from Federal funds. This program will involve the purchase by the city of 254 tons of sand, 378 tons of rock, 400 barrels of cement, 1,200 feet of lumber, 1,500 feet of No. 12 galvanized wire, 20 bundles of stakes, and 40 pounds of nails.—Clinton Henning, Engineer for City.

Lorain, Ohio

Although the street maintenance program for Lorain has not been completed, the following work has been practically decided upon: repaving 17,000 square yards of cement concrete pavement at an estimated cost of $47,000; constructing 3,333 square yards of water-bound macadam, grading and cindering 6,000 square yards of unpaved streets, cleaning and grading streets and alleys, repairing sidewalks, and ditching on both sides of 64,000 linear feet of unpaved streets at an estimated cost of $55,000 as CWA projects; it is also planned to surface-treat 3,600 square yards of old macadam base, macadamize 2,100 square yards of unpaved streets, scarify, grade and roll about 13,000 square yards of slag macadam streets that are badly rutted, and scrape and grade several miles of unpaved streets at an estimated cost of $6,000. We are also planning city water line extensions at an estimated cost of $7,000.—Henry F. Alexander, City Engineer.

Marinette, Wis.

Light resurfacing of about 10 miles of streets with gravel will comprise a portion of the CWA maintenance program in Marinette for the next six months, at an expenditure of $11,000. Streets that have already been surfaced will have a resurfacing with a very light coat of gravel. The material is being furnished by the county, and the city owns all the equipment necessary.—A. L. Hillis, City Engineer.

Massillon, Ohio

The maintenance program of Massillon will consist in blading, sweeping, patching and graveling the streets within the corporate limits at a total cost of $30,000. Welfare labor will be used for sweepers. No equipment will be purchased, but there will be small purchases of slag, tar, emulsion and cement.—C. E. Rice, City Engineer.

McCook, Nebr.

The city of McCook is planning only the necessary maintenance of pavement for 1934, with a certain amount of grading on dirt streets and probably a surfacing of eight to twelve blocks of dirt roads with cinders, at a total cost of $2,500. The city will probably purchase a 1½-ton truck and 2 tons of emulsified asphalt for this work.—Fred H. Thomas, City Engineer.

Minneapolis, Minn.

An expenditure of $195,000 is to be made for street maintenance in Minneapolis during the next six months, divided as follows: $60,000 for winter maintenance in January, February and March; and $135,000 for summer maintenance during April, May and June. The program will involve the purchase of 2,000,000 gallons of road oil to be used during the oiling season between April 1 and October 31; about 857,000 gallons during April, May and June.—F. T. Paul, City Engineer.

Missoula, Mont.

The general maintenance program for the next six months in Missoula will cost about $9,000 plus about $4,000 for re-oiling the streets.—W. H. Swearingen, City Engineer.

Moberly, Mo.

The street maintenance program for Moberly calls for the relaying of the top course of a two-course brick pavement and constructing an asphaltic concrete wearing surface on a one-course brick pavement at a total cost of $10,000, using CWA labor. No new equipment is to be bought, but purchases are to be made of the following materials: 150 tons of asphalt, brick, 7 cars of cement, sand, gravel and stone.—H. W. Thomas, Jr., City Engineer.

Montgomery, Ala.

The city of Montgomery has made no formal program for street maintenance and improvements for the next few months. It has been getting, and expects to secure until about May 1, numerous appropriations from the CWA for street improvements. With these funds the city has re-graveled many miles of streets and relaid certain old brick pavements and has been able to put seal-coating on a large area of cheaper types of pavement.—J. M. Garrett, City Engineer.

Mt. Carmel, Pa.

The only street maintenance planned for Mt. Carmel is on the earth roads, which will be given the absolutely necessary attention to prevent accidents. Local material will be used. Plans have been made for about three blocks of broken stone base with black top paving, financed through the county-aid gasoline tax fund. This work will involve the purchase of some small tools and equipment, crusher-run stone, stone chips and asphalt.—Harry W. Jones, City Engineer.

Munhall, Pa.

The borough of Munhall is not planning any street improvement program for 1934 and has set aside no money for this purpose. There is one piece of construction in progress on Brierly's Lane being done by the State Highway Department of Pennsylvania. The borough has been required only to adopt grades and alignment and secure the necessary releases for damages.—F. B. Sheaffer, Borough Engineer.

Newark, N. J.

The city of Newark will expend about $100,000 in the maintenance of its pavements this year. Street improvements costing a similar sum are to be performed under CWA in addition to this and will be completed within the next two months.—James W. Costello, City Engineer.

Newcastle, Ind.

The street program for Newcastle consists of widening certain paved streets, which will involve the expenditure of $2,616 and the purchase of cement.—Ernest L. Guyer, City Engineer.

North Chicago, Ill.

All street work in North Chicago this year is being done under CWA, and the city is contributing about $16,000. Some purchases of sand, gravel and cement amounting to about $1,500 are to be made.—L. H. Ball, City Engineer.

Paris, Texas

The maintenance program in Paris will consist of asphalt treatment of gravel and white rock streets, using local gravel for the cover coat, for about 40,000 square yards. About 25,000 square yards of white rock sledged stone streets have been laid with CWA labor, and about 15,000 square yards of gravel streets. The expenditure for maintenance will be about $8,000 for the next six months, and the work will involve the purchase of 45,000 gallons of asphalt and 1,500 cubic yards of local gravel for cover coat.—W. F. Hicks, City Engineer.

Port Huron, Mich.

Port Huron has no extensive street maintenance program mapped out for 1934. There will be the usual patching on paved streets and grading on gravel and dirt streets. For patching, the city purchases an average of two cars of asphalt each year. The Federal Government will complete 41,171 square yards of 3½-inch sheet asphalt resurfacing as a PWA direct grant project within the city. The expenditure for pavement repair and street grading averages about $8,000 per year.—Earle R. Whitmore, City Engineer.

Pottsville, Pa.

The city of Pottsville will use about 40,000 gallons of asphalt for seal coats and a small portion of penetration in its street maintenance program for the next six months, on which it is expected that $12,000 will be expended.—George H. Steidel, City Engineer.

Rahway, N. J.

The plans for street maintenance in Rahway are indefinite with the exception of 7,000 feet of bluestone curb, which is now being reset in concrete with CWA labor, together with a like amount of bluestone walk relaid. The expenditure for this purpose is $8,300, entirely from CWA funds.—Levi Price, City Engineer.

Ridgewood, N. J.

Approximately $7,500 is to be expended for labor, and $3,500 for materials in the street maintenance program in Ridgewood. Purchases of sand, stone, oil and patching material are to be made as required.—R. A. Hartom, City Engineer.

San Gabriel, Calif.

Portions of fifteen streets in San Gabriel are to receive particular attention as part of the maintenance program this year, involving the expenditure of about $62,000 and the use of CWA labor. Rock and oil will be purchased for this work, with CWA furnishing up to 30 per cent for material.—Ira H. Stouffer, City Clerk.

Santa Clara, Calif.

The city of Santa Clara has just completed an extensive paving program, and it is not anticipated that any maintenance will be necessary this year except the pouring of expansion joints and a few such routine details.—George L. Sullivan, City Engineer.

Scranton, Pa.

A program of construction covering many projects authorized and approved by the Federal Civil Works Administrator are now under way, at a cost of about $889,000. This work consists of repairs to dirt streets, construction of pipe drains and sanitary sewers, grading playgrounds, park development, cleaning creeks, etc.—Charles F. Schroeder, Chief Engineer.

Stamford, Conn.

A well-balanced program of street maintenance has been planned for the next six months in Stamford. It includes the patching of penetration or tarred macadam roads with Bitumuls and traprock where needed; the patching of asphalt roads with Colprovia where needed; the filling of cracks in asphalt roads with crack filler where needed; the reshaping of roads, using some gravel and then applying asphaltic road material and local bank sand; the treatment of oiled gravel roads with asphaltic road materials and local bank sand where needed; and the patching of concrete roads where public service openings had been made, by the use of concrete. About $20,000 is to be expended for materials, including 1,000 tons of ⅜-inch traprock, 200 tons of ¾-inch traprock, 40,000 gallons of asphaltic road material, 1,500 cubic yards of local screened bank gravel, 1,000 yards of local bank sand, 60 tons of Colprovia, and 35,000 gallons of Bitumuls emulsified asphalt. Some unemployed labor will be used on this work.—Willard S. Conlon, City Engineer.

Stockton, Calif.

Only the ordinary street maintenance necessary for the protection of the investment in streets in Stockton is to be continued through 1934. The estimated expenditure is $18,800, which will be used only for labor and for the purchase of 5,000 tons of sand, rock and road gravel.—Lyle Payton, City Engineer.

Stratford, Conn.

The town of Stratford is planning only the necessary and usual street maintenance program for the next six months. The public works program does anticipate a great deal of new road construction, beach preservation work, reforestation and mosquito control work to be done by the use of CWA and relief forces. There are 700 men furnished by the relief agencies who will come under the direct supervision of the Public Works Dpartment, which will supply materials and equipment. Approximately $40,000 will be spent by the town to support these various projects.—D. N. McLeod, Superintendent, Department of Public Works.

Syracuse, N. Y.

The 1934 program is expected to duplicate the program in 1933, when approximately 100,000 square yards of street areas were surfaced or resurfaced with cold-mix asphaltic concrete, and about 60,000 square yards were surfaced with cold-mix bituminous concrete with tar binder. All this work is done under city supervision, using city forces drawn for the most part from the welfare list. The city forces built and set about 16,000 feet of concrete curbing during 1933. If present plans mature, there probably will be built and set during 1934 about 40,000 feet of this curbing.—W. F. Kavanaugh, Deputy City Engineer.

Teaneck, N. J.

Teaneck will undertake only general maintenance of its streets during the next six months, at a cost of not more than $5,000, which will include the purchase of crushed stone, cinders, tar and asphalt. The labor required up to about one-half of the total is being furnished by local emergency relief.—Paul A. Volcker, Township Engineer.

Troy, Ohio

The removal of the present high crowns on about two miles of city streets and grading about one mile, as well as repairs to curb, gutter and sidewalks, surface treatment of about three miles of streets, and the construction of about a half-mile of new sidewalk, will complete Troy's maintenance program this year. The cost will be about $50,000, a part of which will be expended for 50,000 gallons of bituminous material, 2 cars of cement, 2,000 cubic yards of gravel, and 50 cubic yards of sand.—G. L. Smith, Service Director.

Tyrone, Pa.

The borough of Tyrone is heavily indebted and plans to make only the absolutely necessary emergency repairs during the next six months. The maximum expenditure will be $3,000.—A. G. Andrew, City Engineer.

Urbana, Ohio

The street maintenance program in Urbana involves the repair of streets, using tar and crushed stone at a cost of about $6,000. About half the labor will be relief workers, paid in cash, or men working for groceries and coal supplied to their families.—Emmett F. Sweetman, City Engineer.

Vallejo, Calif.

About six blocks of asphaltic concrete streets are to be repaved and about 1,000 tons of the same material is to be placed throughout Vallejo in patching, involving an expenditure of about $40,000 for this part of the maintenance program. The welfare work includes excavation and embankment construction, and if further CWA appropriations are made will amount to probably $30,000.—T. D. KILKENNY, City Engineer.

Waterloo, Iowa

There is no street maintenance program in Waterloo other than city forces and CWA work, although necessary repairs will be made to asphalt pavement, using Crown rock.—NATHAN B. BARBER, City Engineer.

Wethersfield, Conn.

The regular spring maintenance of about 40 miles of paved tar roads is to be undertaken within a few months by the town of Wethersfield at a cost of about $5,000.—P. O. ROBERTS, Town Engineer.

Weirton, W. Va.

The widening of Main Street in Weirton for a distance of 3,700 feet, and the installation of two storm sewers to drain the same section, at a total cost of $30,000, is being considered this year. The city, not being incorporated, has most of its improvements made by the county and state; therefore, these improvements are going forward under the supervision of the State Road Commission with CWA labor.—J. EDWARD COLLINS, City Engineer.

West St. Paul, Minn.

The following contract work as part of the street maintenance program is planned for the coming six months in West St. Paul: 10,000 square feet of 4-inch concrete walk; 2,000 square feet of 5-inch concrete driveways; 2,000 linear feet of combined concrete curb and gutter; and 1,000 square feet of old tile sidewalk relaid. In addition, 5 miles of 6-foot-wide tile sidewalk is to be repaired, the city furnishing the material and CWA furnishing labor; also, 10,000 cubic yards of gravel will be spread on the streets and alleys, the material being furnished gratis and labor and truckage by the CWA; 576 linear feet of sewer material is to be furnished by the city and the labor by CWA. This program will necessitate the purchase of 200 linear feet of 18-inch vitrified clay pipe of double strength, 300 linear feet of 15-inch similar pipe, 76 feet of 12-inch similar pipe, 10,000 sewer brick, and 6 cast iron manhole and catch-basin frames and covers.—J. E. Carroll, Assistant Chief Engineer, City of St. Paul, Minn.

Wichita, Kans.

Wichita will do just as little maintenance work as possible in 1934, but will endeavor to keep the pavement in good condition for traffic. The anticipated expenditure is about $2,000, which will include the purchase of 40 tons of asphalt and 200 barrels of cement.—P. L. BROCKWAY, City Engineer.

Wilkes-Barre, Pa.

The city of Wilkes-Barre has set aside the sum of $40,000 in its appropriation ordinance for street maintenance during the coming year. Under its welfare work, the city has set aside a sum sufficient to fulfill its obligations in connection with CWA projects, and will transfer sufficient money from other accounts to carry on this work. The program has necessitated the purchase of picks, shovels, sand, cement, lumber and sewer pipe, and all the projects are well under way.—WALTER P. JOHNS, City Engineer.

Wilkinsburg, Pa.

A few years ago the borough of Wilkinsburg spent about $500,000 in replacing a number of old streets with modern paving. At present some of the remaining streets are being repaved with CWA funds, which has totally eliminated a maintenance program this year. The repaving consists of taking up the old brick, cleaning it and placing it on the old base, which is shaped up with about 3 inches of granulated slag sand, and using sand filler for the brick.—CHARLES F. SPERLING, City Engineer.

Willimantic, Conn.

Street maintenance work in Willimantic this year will consist mostly of resurfacing streets throughout the city. No permanent street improvements are included in the budget. The anticipated expenditure is about $9,000, and road oils and traprock are to be purchased.—JOHN F. COLLINS, City Engineer.

Smoke a Sordid Breeder of Slums

THE unfortunate fact that the direct connection between smoke and slums has almost wholly escaped notice except in scientific circles, is pointed out in a timely statement released for April publication by H. B. Meller, Head, Air Pollution Investigation, Mellon Institute of Industrial Research, and L. B. Sission, Industrial Fellow, Pittsburgh, of the same institution. To quote in part:

"Slums are synonymous with grime and the deterioration of both people and property. The smoke deposit which falls most heavily in densely crowded areas is the principal source of their dirt and is therefore the chief agency in bringing degradation to 'blighted' city areas.

"Obvious though this fact be, all sorts of new constructional and rehabilitation projects are being advocated with seeming scant regard for the quality of air supply or appreciation of the millstone that excessive air pollution will hang around the necks of people who live in new buildings swept by the unchanged atmosphere of an old slum section.

"Concentrated smoke deposits do more than impose a barrier to the effective and economical regeneration of 'blighted' areas. They plague new suburban developments. England reports marked degradation of suburban districts as a result of uncontrolled smoke in housing developments of the last decade. The dwellings erected there with Government funds are undergoing slow but steady damage through the action of smoke deposits, thus endangering the investment.

"There is time left for action to prevent any such mistake on the part of governmental and other agencies which presumably are to have a leading part in the American building program. By establishing a policy of practical smokelessness in location, construction and equipment, the Government will not only safeguard its loans but at the same time put merited emphasis on social and esthetic considerations which in the past have been grievously neglected in urban housing.

"Indicative of what we believe is the real feeling of city people about air pollution is the instance of St. Louis. The new mayor there, supported by business and civic organizations, including the Citizens' Smoke Abatement League, is personally heading a movement for purer air. His fact-finding committee has just submitted recommendation for a new and much more drastic ordinance. The President of the Industrial Club, who is also President of the Chamber of Commerce, has stated his realization of the existence in all our cities of unprecedented amounts of obsolete and worn-out fuel-burning appliances, and is suggesting that his home industries grasp the opportunity to bring out satisfactory equipment to meet the demand which is developing.

The authors of this statement would, no doubt, be glad to correspond with any reader of THE AMERICAN CITY seeking practical suggestions as to local procedure.

Placing Concrete at Six Degrees Below Zero

Stadium Built at Ridgefield Park, N. J., During Severe Winter Weather

AN outstanding example of making constructive use of CWA funds is found in the extension work on the Ridgefield Park municipal stadium. Starting early in December, 1933, to provide work for a number of the community's idle men, concrete has been continuously placed on this job, even during the cold snap in the last week of December. A couple of times that week the mercury dropped to several degrees below zero. In fact, one morning when concrete was being placed, the thermometer registered six degrees below zero.

The job is a CWA project, No. 2356, and is providing work for about 100 men. The standard working day is 7½ hours, and the job is operated four days a week. The duration of the work is estimated at twelve weeks. The total amount appropriated for labor is $17,400, contributed by the Federal Government. The town is furnishing the materials—"Incor" high early-strength cement, aggregates, reinforcing steel, form lumber, etc.

The work consists principally of building an approach of concrete steps and inclines down the slope of a natural amphitheater, and of extending the existing grandstand in the stadium at the foot of the slope. The grandstand occupies the lower central portion of the slope opposite the arena. The approach is on the eastern face of Teaneck Ridge, on which Ridgefield Park is built, and provides access to the stadium and grounds from the town's street system.

The approach is 30 feet wide and rises 44 feet above the grandstand's upper seat tier, the horizontal distance being 184.5 feet. The grandstand's height above the arena is 8 feet. Making up the approach are five tiers of steps and connecting inclines, with an additional incline extending from the bottom tier to the grandstand. Each tier has 16 steps with 12-inch tread and 6-inch rise. Connecting inclines are each 12 feet long. The incline between the bot-

CONCRETING THE RIDGEFIELD PARK, N. J., STADIUM, WITH CWA LABOR

1. The existing stadium. 2. Heating the mixing water. 3. The mixing operations. 4. Placing the concrete in the grandstand extension

tom tier and the grandstand is 64.5 feet long. With the exception of 20 lineal feet of macadam at the grandstand end of this incline, all the inclines are concrete, 6 inches thick. Also the steps, as previously stated, are concrete, the minimum thickness being 6 inches.

The architectural treatment includes decorative lamp-posts, concrete seats at inclines between steps, and a bronze plaque and flagpole base at the foot of the approach.

The existing grandstand, 200 feet long and 22 feet wide, with eight tiers of seats, is being extended to twice its length. One hundred feet is being added at either end. The tread and rise of the seats are 2½ feet and 1 foot respectively, with the exception of the top seat, where standing room is also provided and the tread is 4½ feet.

Handling the Concrete

There are 500 cubic yards of concrete in the job—all made with the high early-strength cement. The mix is 1:2:4. Concrete is mixed in a ½-yard mixer and transported in wheelbarrows to the point of depositing.

Mixing-water for the concrete is heated to 120 degrees, and the aggregates to from 80 to 90 degrees. As a result, the concrete is deposited in the forms at an average temperature of 70 degrees. The water is heated in three ordinary hot-water house tanks connected to the supply line of the mixer. The aggregates are heated separately. Upon delivery to the job they are dumped on corrugated iron culvert pipes in which fires have been built. As the desired temperature is reached, the aggregates are measured out and fed into the mixer.

After finishing, the concrete is enclosed with tarpaulin and heated with salamanders for twenty-four hours. In this time the concrete gains sufficient strength not only to resist freezing but to permit the protective covering to be removed, the forms are stripped and the concrete rubbed with carborundum stone and a 2 per cent solution of calcium chloride. Being able to strip forms in twenty-four hours on this job has resulted in a saving of from 250 to 350 per cent on form lumber, thereby increasing the percentage of appropriated funds available for labor.

Despite the existence of low air temperatures during the placing and curing of much of the concrete on the job, none of it has been damaged by frost. In fact, its general quality, as gaged from repeated observations and tests, compares favorably with that of concrete made under more normal weather conditions.

When these improvements are completed, the stadium and its grounds will be dedicated to the veterans of foreign wars and will be given the name of Veterans Park. The grounds cover 15 acres and contain, in addition to the stadium, eight tennis courts and a 40 by 80-foot wading pool.

Zinc in Drinking Water

By **AUGUST G. NOLTE and WARREN A. KRAMER**

Chief Engineer and Senior Chemical Engineer, respectively, Chain of Rocks Plant, Water Division, St. Louis, Mo.

THE complaint of turbid water drawn from consumers' taps cannot always be reasonably dismissed to the satisfaction of either the consumer or the producer. The appearance of a white precipitate drawn from galvanized pipe cooling systems led to the investigation of the presence of zinc as an explanation of this condition in the St. Louis water supply.

From a review of the early literature on the subject it was found that opinions and experiences regarding the harmful effects of zinc are quite conflicting. Recent investigations are more in agreement and report the presence of zinc in drinking water to be less objectionable.

Bartow and Weigle made a survey of the waters of the Missouri-Kansas-Oklahoma zinc district. From numerous samples examined by the field test, they selected eleven for laboratory analysis. The results show the presence of from 1.5 to 50 ppm of zinc. According to the best evidence obtainable, the water containing zinc was used by man and animals without harmful results. To confirm the evidence they obtained in the field survey, samples of these waters were used in rat-feeding tests. Twenty-four rats, divided into six groups of four each, were given for a period of forty days one of the following solutions: (1) distilled water; (2) tap water; (3) 50 ppm of zinc; (4) 100 ppm; (5) 500 ppm and (6) 1,000 ppm. Rats refused to drink a solution containing 5,000 ppm of zinc, probably because of the astringent metallic taste.

"At the end of the experiment all the rats were apparently healthy, although those fed the higher concentrations of zinc drank considerably less, ate less and gained less. The indication is that reasonable amounts of pure zinc salts in drinking water are not harmful."

Perhaps the most recent report on zinc is that of Drinker and Fairhall. They have accorded zinc a new hygienic position and state that a limit of zinc contamination of 5 parts per million as placed in Public Health Report 1925 (Reprint No. 1029) is neither feasible nor necessary. If a limit is desirable, 30 parts per million is suggested. They also state:

"The zinc compounds in the water will be a mixture of oxide, hydroxide and carbonate. If present to an amount of 30 mg of zinc per liter, zinc carbonate will cause appreciable milkiness in the water, and many persons will complain of an astringent taste. While there is no reason to consider this harmful, it is doubtful whether any community would tolerate it without incessant complaint. Both taste and appearance act to prevent zinc in its most common form from being a persistent contaminant of water supplies even in amounts which are harmless."

Waters carrying 5 ppm of zinc have been encountered in various localities. They are generally characterized by turning opalescent and exhibiting a greasy film on boiling. In new systems of galvanized pipe this may continue for some time. Apart from the harmful effects, the presence of zinc in quantities greater than 5 ppm may become a nuisance.

Experiments were conducted with strips of galvanized iron in tap water, treated water with the pH adjusted to 10.5 with lime and also with CO_2, and tests were made of

the residual zinc in tap samples. It was found that tap water in contact with galvanized piping will react with the zinc, forming a basic zinc carbonate. After the saturation point of the water is reached, the material continues to form and remains in suspension. The largest concentration of zinc found in water from any much-used tap was 5 ppm. Even in the case of the galvanized pipe standing in tap water, the zinc did not exceed 5 ppm until after 24 hours had passed. In the two other kinds of solutions treated in this investigation, the zinc after four days' standing was less than 5 ppm in those samples whose pH values fell within the pH range of drinking waters. It is therefore not likely that zinc in any treated water supply is likely to become a nuisance from a sanitary standpoint, but it may rise to complaints of turbid water from those who are obliged to use it.

This investigation was not concerned with the germicidal property of zinc, but it is interesting to note here that Scott and Jameson state that "from 3 to 4 parts per 100,000 of metallic zinc (as sulfate) appeared to be sufficient, after 24 hours' contact, to inhibit, if not destroy, coli form organisms in numbers considerably exceeding those likely to be found in any ordinary drinking supply. As small an amount as 1.5 per 100,000 of metallic zinc (as sulfate) renders water practically sterile in 48 hours. In water containing zinc naturally in solution as a carbonate, complete sterilization appears to take place between 48 and 72 hours."

The presence of CO_2 has a good deal to do with the solution of zinc in nearly neutral waters. Zinc dissolves readily in strongly acid water, forming zinc salts of the acid; likewise in caustic alkaline solutions zincates are quickly formed. However, in waters that are only very weakly acid or very weakly alkaline, such as drinking water, the solution of zinc proceeds but slowly. The reaction is hastened by carbon dioxide and the presence of iron, and is retarded by sulfates.

The zinc increases more or less uniformly in those solutions in which the hydrogen-ion concentration was adjusted with H_2SO_4. In the solutions to which carbon dioxide gas was added to reduce the pH, there is a sharp increase in zinc concentration between pH 5.3 and 6.1. The composition of a drinking water is perhaps a more important factor than the hydrogen-ion concentration in classifying it as corrosive or not with respect to zinc. A water high in non-carbonate hardness would be expected to dissolve less zinc than a water high in carbonate hardness and low in non-carbonate hardness. The salts formed with zinc by the action of the water are perhaps complex and vary greatly in solubility.

The solution of zinc by tap water from galvanized iron pipe and sheets in these experiments supports the experiences of others and leads to an esthetic, but not a sanitary, doubt concerning the desirability of zinc-lined containers for the storage and transportation of drinking water. When 2 ppm of zinc is present, the water is faintly opalescent; 5 ppm of zinc makes the water nearly opaque, and not many would care to drink it.

From this investigation and those of other authors, it may be safely assumed that zinc, in the amount found in drinking water, has no harmful physiological effects, however uninviting it may appear.

What the Syracuse Public Health Demonstration Has Accomplished

AN unusually complete and adequate community health program, such as Syracuse, N. Y., enjoyed in 1931, costs about two dollars a year per capita, a purchase worth more to every citizen than a theater ticket, a carton of cigarettes, or a big box of candy. In the recently published book, "A City Set on a Hill,"* Dr. C.-E. A. Winslow tells the story of the health demonstration at Syracuse, N. Y., conducted by the Health Department of that city in cooperation with the Milbank Memorial Fund. Dr. Winslow is Professor of Public Health at the Yale School of Medicine; also a member of the Board of Scientific Directors of the Rockefeller Institute, and expert assessor of the Health Committee of the League of Nations.

The Syracuse demonstration was carried on for the ten years preceding 1932 in an effort to determine whether an adequate investment in health by a city would produce a perceptible effect on public welfare and yield returns in decreasing death and disease figures. According to Dr. Winslow's report, the results show that public health pays dividends. In general it is shown conclusively that with a health program in 1931 costing $500,000 Syracuse effected an annual economic saving of well over $2,000,000 in only three groups of diseases. The following are outstanding items of progress during the ten years of the demonstration:

Reorganization of the Department of Health under a full-time Commissioner, with eleven bureaus, all but three of which have full-time heads.

Establishment of an unusually sound system of vital statistics and record-keeping, which has been in large measure a model for the development of national standards in this field.

Development of a program for the control of tuberculosis which Sir Arthur Newsholme pronounced "the best I have known in any area in America."

Coordination of the work of various agencies in the field of maternal and infant hygiene into a compact program of real excellence.

Coordination of the health program for children in public and parochial schools under a single director.

Combination of specialized nursing service into a single well-organized and well-supervised staff for generalized public health nursing.

An excellent and effective campaign for immunizing school children and pre-school children against diphtheria.

A well-planned program of popular health instruction.

A demonstration program of visiting teacher service of unique excellence.

Organization of a health council and of a strong citizens' committee for the support of the community health porgram.

Dr. Winslow discusses all these activities in detail and points out, in conclusion, that in attacking the size of his taxes, the citizen must ask himself whether his city government, with its protection of life and property, the safeguarding of health and the education of children, is worth the cost. He says:

"The particular two dollars spent on the average by each citizen for health bought a clean and sanitary city; protection against epidemics of smallpox, typhoid fever, and diphtheria; the saving of the lives of hundreds of infants; the reduction of tuberculosis, once the greatest scourge of mankind, to a minor role in the death rate. . . . We shall need courage, tenacity of purpose, and intelligent discrimination to pass through the present crisis without sacrificing precious standards of social values which we hold in trust for the future. Yet we can more easily look our children in the face when the emergency passes if we have refused in temporary panic to throw away what was most valuable in our social system."

* Published by Doubleday, Doran & Co., Garden City, N. Y.; 367 pp.; $3.00.

The Cases for Municipal and Contract Collection of Refuse

Portions of a Discussion Presented Before the International Association of Public Works Officials

MUNICIPAL COLLECTION

By J. Eugene Root
Director of Public Works, Cincinnati, Ohio

WHAT the householder is especially interested in and concerned with in the removal of household wastes is service—and regular service. The householder is required by resolution or ordinance, or by rules and regulations of a waste collection department, to meet certain requirements, such as the size and type of the container, a regular place for the filled container, either at the curb or within the property at the collection time. The regular and prompt pick-up of the wastes on the specified collection day is a service that can best be rendered by a city.

A contractor, whether the contract be for constructing a house, a street pavement, a sewer, a sewage treatment plant, or for the collection and disposal of garbage, rubbish or ashes, is primarily interested in a profitable contract; service is naturally a secondary consideration.

The city is, or should be, primarily interested in service, and is never interested in profit, although it should be interested in the economy of the service.

Comparing Baltimore and Cincinnati

Baltimore requires on the part of the householder the provision of at least three receptacles: (1) for garbage collected by the city; (2) for rubbish collected by the contractor; (3) for ashes presumably collected by the city. Cincinnati requires only two receptacles: (1) for combustible wastes; (2) for non-combustible wastes.

In Baltimore the householder places the containers at the curb or the sidewalk line. In Cincinnati the cans are picked up at the rear house line by city employees, and empty containers are returned to the rear house line.

The advantages of municipal collection are: (1) the wrapping of garbage by the householder, thus providing clean containers, minimizing odors during collection, eliminating fly nuisance at incinerator, and furnishing additional fuel for incineration; (2) regularity of service, twice a week in summer and once a week in winter, the watching of trucks and the elimination of tipping; (3) fewer complaints; (4) greater courtesy; (5) lower cost. In Baltimore the cost is $1.22 per capita per year, not including ashes. In Cincinnati the cost is $1.25 complete, and with an area of 72 square miles collection is made from 462,000 persons.

There are many advantages in favor of city collection. Certainly there is no other service to the citizen which is so personal as this one of garbage collection. In Cincinnati if the collection truck is fifteen or twenty minutes late on a route on a certain day, the office is almost sure to receive a telephone call from a householder stating that the garbage collection has been missed, when in reality there is just a little delay on the part of the equipment in arriving in that area. It would be almost unreasonable to expect service of that kind from a contractor. On the other hand, a watch truck is maintained at the incinerator and any complaint received is immediately taken care of by the city. Whether or not this can be expected of a contractor, even though it is specifically called for in the contract, is questionable.

The regularity of city service is beneficial, and it has been possible to reduce the number of complaints to almost nothing. Cincinnati has had experience with both types of service. Until June 1, 1931, and for many years prior to that date, the garbage was collected by a contractor. Up to that time the city collected and disposed of the rest of the municipal wastes. Complaints were frequent, and it was difficult for the city officials to get the contractor to give proper attention to the matter. No difficulty is experienced with the city employees in the handling of complaints.

Another minor item in favor of city collection is the question of courtesy to the taxpayers. If a city is to maintain its good standing, it is essential that its personnel should be courteous to those with whom it is dealing.

Costs vary—and they should vary—between cities, since no two are similar as to the various conditions which affect costs; therefore, too much reliance must not be placed on comparing the unit cost in one city with that of another. Differences in the factors making up the unit cost may justify a high unit cost in one city and a low unit cost in another.

CONTRACT COLLECTION

By Robert B. Brooks
Consulting Engineer, St. Louis, Mo.

THE question of contract vs. municipal collection of refuse is one that directly affects the pocketbook of every taxpayer. There are four reasons why the contract method of refuse collection is better than a municipal collection: first, contract collection insures a businesslike development; second, municipal collection will be bound up with some political machine and consequently will be less efficient; third, municipal collection means poor maintenance of equipment for fear of increased taxation; fourth, municipal collection has never proved entirely successful because it does not have the best workmen, and because it is slow in operation and inefficient in satifying complaints of property owners.

The following socialistic arguments have been advanced from time to time in favor of municipal collection: (1) the fact that collection is a natural monopoly would rule

out individual profits; (2) contract collections allow too great a chance for high prices; (3) municipal collection means that costs are reduced to the minimum; (4) municipal collection eliminates the chance of corrupting city officials.

Our present party system prevents the continued development of a municipal collection system. Most officials are familiar with the fact that change in administration means a distinct change in the garbage collection system. The party organization which was not in power was built up on promises, either verbal or implied, that should the municipal head of the ticket be elected, to those who did their political work efficiently would be given jobs. One of the principal mistakes made by most candidates is to promise many times the number of jobs which are at their disposal after election. With a change of municipal administration, garbage collections are usually disrupted. Incompetent and inexperienced men have in many cases been placed in charge of the service, and all the employees of the refuse section, from collector to foreman, superintendent and inspectors, have been discharged and inexperienced help put in their places. These things are no secret. They have been given ample publicity in the pages of our newspapers time and time again when a change in the head of the municipal administration has taken place.

On the other hand, a contractor is forced to pick men of ability and experience who can most economically collect the refuse to the satisfaction of the people of the community. Only in this way can he be assured of a profit to himself and a continuance of his contractual relations with the municipality. A contractor develops his personnel and equipment along lines dictated only by economy. Desire for profits is a compelling force. A business man knows that in order to gain profits he must keep abreast of the times or be eliminated. This is true in the contract collection of refuse just as much as in any other business.

Political Jobs

The head of a municipal refuse collection division generally does not have the right to hire and fire. He must take as employees men who are sent to him by the boss of the local committee, who is delegated to hand out the jobs as rewards for political services rendered. It is not unreasonable that a workman obtaining his job under such circumstances, and realizing that his foreman may not know any more about the job than he does, may not choose to exert himself physically or mentally in the actual work of refuse collection, but rather will study how he can continue in favor with the present committeeman who was originally responsible for his appointment. Such inefficiency could not exist under a contract system, because the success or failure of the contractor depends on rendering satisfactory service to the community.

Efficient collection calls for keeping to schedules in collection, which requires not only good equipment but reserve equipment. At least one piece of equipment is necessary as a reserve for every ten pieces in use. Refuse collection equipment, to be satisfactory from the citizens' standpoint, must be kept clean. Refuse collection is seasonal. Collection may run from less than 100 tons of garbage a day in January to as much as 500 tons in the peak month of September. On the other hand, collection of ashes will be more in January and February, with practically nothing in the summer months. This means that the equipment and personnel must be used to the maximum during peak times.

In some cities and towns equipment maintenance is carried on by a different department from the one that collects refuse. It is no secret that in some cities where the heads of the two departments are not friendly, weeks and sometimes months elapse before minor repair work is done on refuse collection equipment. Another reason that equipment is better maintained under the contract system than under municipal collection is that under municipal collection the operation of the section or bureau is limited as to funds.

Many refuse collection officials in the last four years who have asked for refuse collection equipment have been told by Boards of Estimate and Apportionment, or their Comptrollers, that the taxes have not been coming in quite so regularly as before 1930 and that consequently they not only cannot have new equipment but must cut down the budget of the refuse section in order to live within their income.

In one city a request for the renewal of canvas covers over the garbage equipment was refused. This amounted only to $1,000 for the year. Can anyone imagine a contractor's being able to refuse a city official the replacement of tarpaulins which hide fermenting garbage or dusty ashes from the sensory nerves of the taxpayers? The contractor must live up to his contract and keep his equipment in sanitary condition. This is not the case under municipal collection, where the head of the section finds it too easy to pass the buck by saying the department was not allowed sufficient funds.

The United States Food Administration data of 1918 showed that in the cities of over 10,000 population refuse collection service was handled as follows: 16 per cent with city forces; 28 per cent combined public with private collection; 22 per cent delegated the service by contract; 22 per cent functioned under a dual arrangement of private collection and contract service.

EDITORIAL NOTE.—Although a believer in municipal collection, Mr. Brooks offered to present the case for contract collection to stimulate discussion at the convention of the Association.

Nine Cities Contract for TVA Power

CONTRACTS to serve cheap TVA electricity to nine cities with a population of approximately 200,000 have been signed by the Tennessee Valley Authority, David E. Lilienthal, TVA director in charge of power, announced on March 21.

Heading the list is Knoxville, which already has been granted a loan by the PWA to construct distributing lines. The city's offer to purchase the existing facilities having been turned down, officials are now negotiating with an engineering firm to draw plans for a new system.

Other cities with which contracts have been signed are Decatur, Florence, Sheffield, Tuscumbia, and Russellville, in Alabama; Pulaski, Tenn., and Amory, Miss. Tupelo, Miss., the first city to sign for TVA power, is now being served with low-cost electricity from Muscle Shoals.

"As soon as those cities have acquired their distribution facilities, the Electric Home and Farm Authority will begin an intensive campaign to make available low-cost high-grade electrical appliances to householders," Mr. Lilienthal said today. "The outlook at Tupelo already indicates that there will be a large expansion in the use of electricity under the low TVA rates. As a result, the contracts with the eight cities just signed provide for a large expansion in their electric consumption.

Tear Gas for Mob Riot Control

By **BENJAMIN R. MARSHALL**

Superintendent of Police, Pittsburgh, Pa.

DURING the last six months widespread industrial unrest and an unprecedented wave of lynchings have impressed law-enforcement officials with the importance of properly controlling mob violence. These mass disturbances have varied in severity from the rather timid picketing of dye and textile workers in the East to the bloody industrial strikes in mining and steel centers and ghastly lynchings in the South and West. Hitherto peaceful communities, both large and small, have been suddenly seized with the wildest sort of mob hysteria. Police and sheriffs in most instances have made sincerely valiant attempts to restore order or to protect prisoners entrusted to their care. If, as actually has happened in a number of instances, the power of the mob prevailed, the blame lies not in lack of courage of law-enforcement officials, but rather in the inadequate and antiquated equipment at their disposal.

This problem of dealing with a mob of strikers or would-be lynchers is not so simple as it appears to a layman far from the scene of action. If members of the mob were all criminals or irresponsible hoodlums, the methods of police would not need to be tempered or restrained. But such is not the case. Police and deputies look upon the mobsters as good neighbors temporarily incensed and by no means to be met with gunfire or brutal clubbing. In the case of strikers, police must be even more cautious, for today's strikers may be yesterday's and tomorrow's loyal workers, peaceful and law-abiding. In many cases strike mobs include the wives and children of striking workers. Brutality would only breed violence and property destruction, and heap public indignation on police heads. Yet, in spite of such handicapping circumstances, law-enforcement officers are expected to disperse the mob and uphold law and order.

A Safe and Effective Weapon

Fortunately, in recent years science has placed at the disposal of police a weapon which when properly employed solves this problem most satisfactorily to all concerned—tear gas discharged from grenades, riot guns, billies and other ingenious devices. This gas has the peculiar property of being highly disabling without inflicting any painful or permanent injury on its victims. Its effectiveness is derived from its unbearable punishment to the eyes, resulting in profuse tears. There are no poisonous or asphyxiating effects. Victims are compelled to flee the gassed area in order to sooth their burning eyes with fresh air.

Improved gas weapons for police are designed to operate with the utmost safety to both user and victim. None of the various pieces is explosive. The gas vapor is generated at the instant of discharge from a solid mixture of ingredients. Acid or other caustic liquid that might burn or disfigure is not present. Consequently, in its modern form tear gas can be used against mobs containing women and children and in thickly populated areas where the welfare of innocent bystanders must be considered. A dense white smoke accompanies the tear gas discharge and adds materially to the psychological effect.

In a few recent instances newspapers have carried re-

PROPER USE OF TEAR GAS TO CONTROL MOB VIOLENCE
Note that the mob is entirely obscured by the gas cloud

ports of the failure of tear gas to turn back mobs. Such reports should not destroy the confidence which law-enforcement men have placed in their gas equipment. A careful check-up on these instances shows that the fault lay not in tear gas but in the manner and quantity in which it was used by inexperienced officers. True, in several cases, the product used did not deserve the name of tear gas, since it was nothing more than a material with an unpleasant odor and little or no lachrymatory effect. But in most cases where failure was reported, the gas had been used in quantities too small to produce the desired results and in ways that permitted the mobs to escape the effects.

The Dangers of Inadequate Equipment

One investigation disclosed that a sheriff tried to defend the county jail against a mob of several thousand lynchers by using only a dozen small gas hand grenades. All of these were thrown in one barrage, and while the mob were all driven to retreat for ten or fifteen minutes, they returned later to find the sheriff without any gas to stem their march of destruction. Here was a clear case of tear gas doing all that should have been expected of it, but lack of a sufficient supply permitted an atrocity that will long remain a blot on the good name of the community.

In another instance of recent memory police had only fifteen small grenades to cope with a mob of four thousand spread over a quarter-mile front. A 35-mile gale complicated matters by quickly dissipating the light gas concentration. Fortunately, these police used their meager supply of grenades most judiciously and kept the mob back for nearly a half-hour. After the gas supply was exhausted, it was necessary to resort to firearms and clubs, with regrettable tragic results. This stern lesson demonstrated to city officials the necessity of increasing their gas arsenal to several gross of large grenades and adequate gas riot guns. A subsequent mob disturbance which was quelled completely by tear gas justified this precaution.

Defiance—Defense—Defeat

A sharp contrast to the above cases is offered by the method of handling an outlaw strike in a Pennsylvania steel town. For several days the mob had paralyzed all industry in the town by terrorization of the loyal native workers. Only a little tear gas had been used sporadically by local police. Finally, the sheriff of the county, after his stern warning to the hoodlums had gone unheeded, organized a trained gas squadron and proceeded to drive the mob from the streets and beyond the city limits. Gas grenades were supplemented by gas projectiles fired from riot guns, the mob broke into disorderly retreat, and was completely scattered by a gas barrage which was continued for fifteen minutes. No firearms were brought into use. Members of the mob received such a thorough gassing that they never reassembled and the strike was completely broken.

Far from being discredited by some erroneous reports of its ineffectiveness, tear gas is daily finding more widespread use as a mob control agent. Larger, fast-discharging grenades and accurate long-range projectiles have overcome the handicaps imposed by wind and distance. Progressive police departments have organized specially trained gas squads and have equipped them with riot cars, gas masks, and a full complement of grenades, billies and gas riot guns. Training in the proper use of gas has been added to the curriculum of police schools. Hence, a better solution of this problem of handling lynching and striking mobs needs only the full cooperation of municipal and county officials in providing a proper and adequate supply of tear gas equipment.

A Spacious Boulevard in Rio de Janeiro, Brazil

For this photograph and the one reproduced on the front cover of this issue, THE AMERICAN CITY is indebted to the City Engineer of Rio de Janeiro, Armando de Godoy, who was a recent visitor to the United States

New Designs for Stands and Booths in City Parks

MODEL news-stands, refreshment stands, bootblack stands, and police booths, standardized housing for concessions in the parks and playgrounds of New York City, designed by the CWA staff of architects, engineers and landscape architects working at the Arsenal, are attracting public interest.

In accordance with these plans, each of the several kinds of stands will be uniform in appearance, designed to fit into a park or playground. When these are installed, the miscellaneous structures which now clutter city squares and the entrances to city parks will be eliminated.

The plan for the police booths was arrived at after a conference between the Park Department and the Police Department. These booths, built entirely of metal, will be supplied with telephone, lights and a writing shelf. The glass windows extending completely around the booth afford an unobstructed view in all directions.

The model refreshment stand is in reality a complete kitchenette. Water, gas and electricity connections will be installed, also electrical connections for refrigeration and ventilating fans. The serving counters and working parts will be constructed of monel metal, the walls and booths of wood and formica.

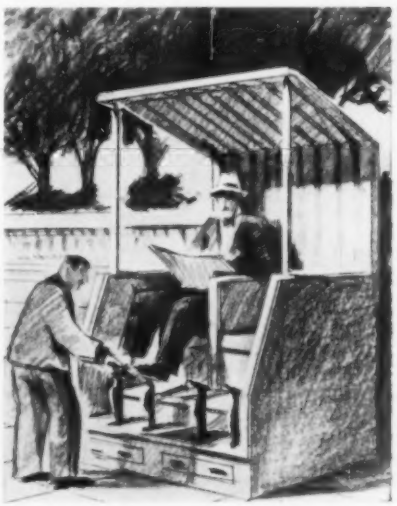
News-stands in three model types are designed to be constructed of monel metal, wood and formica. One of these, octagonal in shape, for use in the open, is accessible from all sides. The other type is oblong, to fit against a wall or fence. Both of these stands are for permanent installation, soundly constructed of metal, wood and formica, with steel shutters which pull down, protecting the merchandise when not in use.

Another temporary news-stand has been designed, folding up when not in use, something in the manner of a wardrobe trunk. All the news-stands will be painted a neutral shade, depending on the colorful display of magazines for decoration.

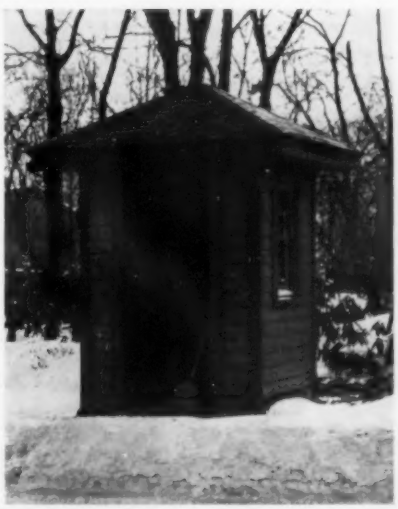
The new model bootblack stand will also be temporary in character, inasmuch as it can be folded, padlocked and transported from place to place. Each stand will be equipped with two chairs, and two drawers, installed under each chair for brushes and the necessary supplies. The backs of the stands extend up and over the top of the chairs, affording protection to occupants from sun and rain.

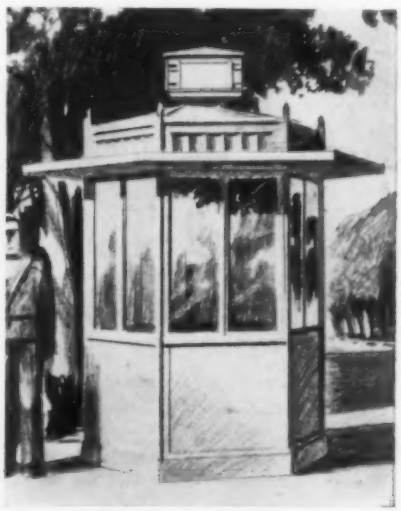
These designs were made by A. G. Lorimer, A. Martini, and George Levy, CWA workers, under the direction of Aymar Embury, 2nd, architect.

THE UNSIGHTLY NEWS-STAND OF TODAY (LEFT), WHICH THE PARK DEPARTMENT PROPOSES TO REPLACE WITH A STRUCTURE THE MODEL OF WHICH IS SHOWN AT THE RIGHT



THE BOOTBLACK STAND NOW BEING USED (LEFT) AND THE MODEL OF THE FOLDING STAND (RIGHT) WHICH WILL REPLACE IT





ONE OF THE POLICE BOOTHS NOW IN THE PARKS, AND A MODEL OF THE NEW ONES BEING BUILT

Road Machine Operating Costs Cut 20% to 30%! . .

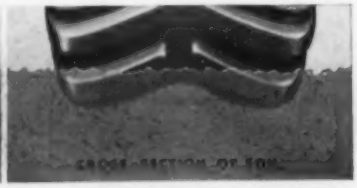
● On graders, snow brooms, or any type of road maintenance machinery, Goodrich Z-P Pneumatics add 30% more traction, 30% more power.

● More work in less time is reported for this maintainer operating on Z-P Pneumatics. From El Paso, Texas, comes a similar report: "In actual operation this grader with new Z-P Pneumatics has enabled the operator to increase his daily mileage from 8 to 10 miles over former tire equipment. A conservative estimate as to the increased performance would be at least 35% in addition to decreased maintenance expense."

● No air pressure is required for Goodrich Z-P (Zero Pressure) Pneumatics. They can't go flat! Deep cuts won't hurt the tire. Punctures, blow-outs and tire maintenance are crossed off the trouble list.

● "Since adopting Z-P Pneumatics we find that gasoline and oil consumption is reduced approximately 20% on our motor patrol graders," says prominent highway official.

● On soft ground or sand an air pressure tire digs in, tends to bury itself, requires more power to move the load. Efficiency is low.



● A Z-P Pneumatic pushes the soil under it, packs it down, actually forming its own track as it goes. No sinking. No spinning. Tread is self-cleaning.

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Local Health Problems Which Must Be Solved

FEW major health problems are local in all their causes and effects. If an epidemic affects one community, the cross-currents of modern communication make it necessary to be watchful of many communities. If a city dumps untreated sewage into a stream, thousands beyond the city limits may be inconvenienced or endangered. On the other hand, a notably good piece of local health work—such as an efficient county hospital or a first-class field service for the discovery and follow-up of tuberculosis—may elevate the whole tenor of health work in the state.

The local health problems considered most urgent by the State Department of Health are those whose solution would advance the welfare of many localities. At the present time two needs are outstanding. If we are to make much further progress in promoting and safeguarding health in the communities of this state, we must have a more modern and efficient type of local health organization, and we must have better trained and more competent local personnel.

In the Horse-and-Wagon Days

Our system of local health administration, with its hundreds upon hundreds of town and village boards of health and health officers, was created by law more than fifty years ago. There were no automobiles, no improved roads, no telephones. There was practically nothing of our present-day knowledge of bacteriology and of disease prevention. The part-time service of a general practitioner of medicine answered public health needs at that time because there was little he could do anyway. For example, no one realized that diphtheria was a germ disease; our fathers believed it due to such causes as open drains. The first crude antitoxin was produced years after our local health machinery was set up. The township was as big an area as a health officer could cover, because it took longer to cross the town then than it does to cross a county today; and, without the telephone, when the doctor was wanted someone had to go after him. Today all this is changed.

Public health is now a special field of medical science; in fact, so broad a field that in the State Department of Health in order to keep abreast of scientific progress we have been obliged to divide it into many sub-specialties such as epidemiology, maternity and infant hygiene, tuberculosis and venereal disease control, sanitation, and rehabilitation of the physically handicapped. The perfectly obvious thing, then, is to have local units large enough to employ full-time, well-trained specialists in this field and to keep them busy. Under our form of government the county is the logical unit. Progress has been made under a permissive law whereby five counties have chosen to establish county health departments, but we have been in the creeping stage long enough. Our system of local health administration should be modernized just as it was originally created, *by law*.

The Health Officer and His Work

A part of this same problem is that of getting properly trained, competent personnel for local health work. Most important, of course, is the health officer, the mainspring of the local organization. In the past fifteen years there has been a marked and progressive improvement in the character and quality of work done by health officers in towns and villages. In considerable measure this has been due to the establishment of qualifications by the Public Health Council, among which has been the required short course in public health. Moderate as those qualifications necessarily have been, we cannot go much further, so far as the towns and villages and smaller cities are concerned, until we have full-time county health officers.

In the cities the situation is different. It goes without saying that a city with a population as large as an average county, unless it is combined in a county health district, needs a full-time, well-trained health officer. The machinery—the organization—is there. It may need a few new parts, but it is there. It is only necessary for the responsible officials and the public to understand what it means to a city to have an efficient health department, in terms of human values as well as of tax levies. Political party affiliations must be forgotten and selections made only on the basis of fitness. When no local man is qualified for a health officer's job, the natural preference for home products must be waived.

The need for properly trained and experienced personnel in technical positions extends down through the ranks. The dairy and milk inspectors, the operators of water treatment and sewage disposal plants have jobs requiring certain technical training and experience. A slip in the operation of any sizable water treatment plant would endanger the life and health of thousands of people; also, thousands of dollars of the taxpayers' money may be wasted through inefficient operation of a sewage disposal plant. These things have happened. Efforts to improve and safeguard public milk supplies have been handicapped and the milk industry subjected to unnecessary annoyance and expense because local milk control was in the hands of men who might have made good clerks or policemen but whose only qualification for milk control work was the fact that they happened to be deserving Democrats or Republicans or Socialists and needed jobs. When every city health department is headed by a well-trained, experienced health officer, this problem will tend to solve itself. Competent executives are not likely to appoint or to accept incompetent aids.

Publicity for the Health Department

Another problem is that of letting people know what health officers and their aids like the public health nurses and milk inspectors are doing and why. Periodically there is a protest, usually started by town supervisors, against the provision in the law that health officers must be paid not less than a specified and rather meager minimum per capita of population. Several years ago this question came up at a meeting of a county board of supervisors. Five adjoining towns were employing the same health officer—the only physician in the whole area. Not one of the five supervisors knew of anything this health officer had done in a year to earn his pay. Naturally, they were quite ready to join in a protest. One of our district officers, who was present, was able to tell them of things the health officer had done within two weeks—things they had never heard of—which, they admitted, almost justified his year's salary. That was the end of the protest. The trouble was that while the health officer had done the work, he had not taken the trouble to tell his board what he was doing and it had not occurred to them to inquire.

Letting people know what is being done to protect their health, why health programs are undertaken, and what the people themselves should be doing to protect their health, goes under the general head of "public health education." It is one of the most important duties of every local health officer, but one often neglected because physicians ordinarily are poor publicists. It is important from the standpoint of the public. There are many things people can do to protect and promote their own health and that of their children. They are entitled to know these things, and it is part of the health officer's job to see that they know. It is a good policy from the standpoint of the health officer himself. Taxpayers resent paying for an activity they know little or nothing about. The health officer who lets people know what he is doing for them and why he is doing it—assuming that he is a person of ordinary tact and good personality—can be sure of public support.

There are numerous other problems, such as how to get more children immunized against diphtheria, getting people with venereal disease under treatment for their own good and for the protection of others, stopping the flow of untreated sewage from certain municipalities into streams used by others as water supplies.

—The foregoing article is from a radio address over station WGY on January 27, 1934, by Dr. Thomas Parran, Jr., New York State Commissioner of Health; in the Municipal Series presented by the New York State Conference of Mayors and Other Municipal Officials.

"YES, MOTHER. *She's right here*"

AT THE close of the day, at the end of the week, at the turn of the year, when your mind ranges back to sum it up, what counts for most?

Is it not the people you spoke to and what you said to them and what they said to you? The ideas born in conversation, the new slant given to your thoughts by a word or two, the greetings and farewells, the advice and the admonitions, the hopes confessed and questions answered—these and a thousand other vocal expressions make up the story of our lives.

To be cut off from human contact is to live but part of life. The wonder of the telephone is that it multiplies human contacts, restores broken ones, strengthens strained ones and constantly develops new ones. In spite of distance or storm or inability to move about freely, you can be as active, sociable, alert and informed as you wish by telephone.

Just think of this the next time you use the telephone. With no greater effort than the calling of a number or the turning of a dial, you can speak to almost anyone, anywhere. No place or person is far away when you can say—"I'll call you up."

Is this somebody's birthday? Is someone in another town being married or celebrating a wedding anniversary? The sound of your voice and your good wishes will brighten the day. The rates are low. You can make a daytime station-to-station call to most places 75 miles away for about 50c. During the evening and night periods many rates are 15% to 40% lower than in the daytime.

BELL TELEPHONE SYSTEM

FORWARD STEPS

Reported by
Municipal Officials, Chamber of Commerce Executives, and Others

Much Less Dense Smoke in Hudson County, N. J.

JERSEY CITY, N. J.—Three years ago New Yorkers had good reason to complain of the dense black smoke that blew across the Hudson River from New Jersey; but not today. For now, after three years war on smoke in the Hudson County area, the Hudson County Smoke Department reports in the 1933 Annual Report to the Board of Freeholders a reduction of 90 per cent in smoke violations on all classes of fuel burners. This amounts to about 85 per cent actual reduction in smoke density over the three-year period.

I lay this improvement chiefly to the fact that fuel users are sold on the idea that they save fuel in proportion to the smoke they abate; and have found in practice that it is true. I find it necessary to take court action only against those who "have no time to abate smoke."

Out of 10,388 stack readings taken in 1933 of locomotives operating in Hudson County, 330 violations have been noted. According to the standard Ringlemann Chart as a basis for measuring smoke, railroad smoke density averaged 3.45 per cent for the year 1933, a reduction of 86 per cent since the Smoke Department began to function in May, 1931.

17,049 observations were taken of industrial plants in 1933. In this number, there were only 396 violations; a reduction since May, 1931, of 91 per cent in violations.

Out of 2,935 observations, 54 violations for tugboats and steamers on the river were noted in 1933. This amounts to a reduction in violations of 97 per cent since 1931.

WILLIAM G. CHRISTY,
Smoke Abatement Engineer, Hudson County (N. J.) Smoke Department.

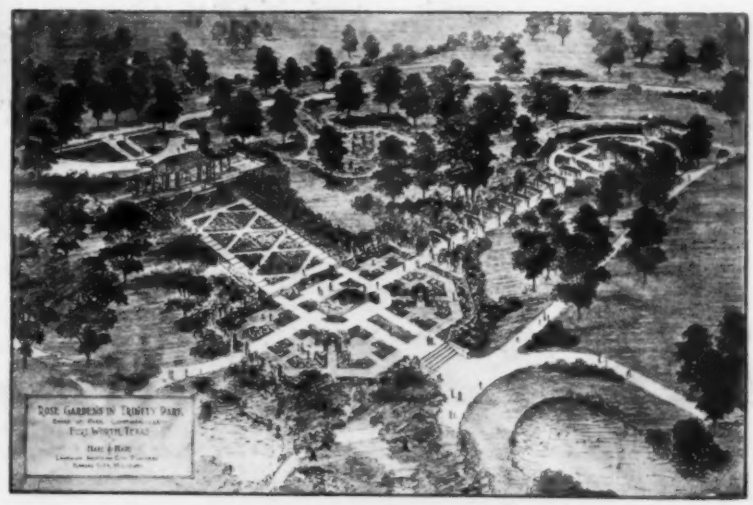
Fort Worth's $1,500,000 CWA Program

FORT WORTH, TEXAS.—When CWA projects to the amount of million and a half dollars for Tarrant County and Fort Worth were being approved in Austin in November, the Fort Worth Park Board, because of a perfected organization and well-defined plans, secured nearly half of the above mentioned sum for park and related projects.

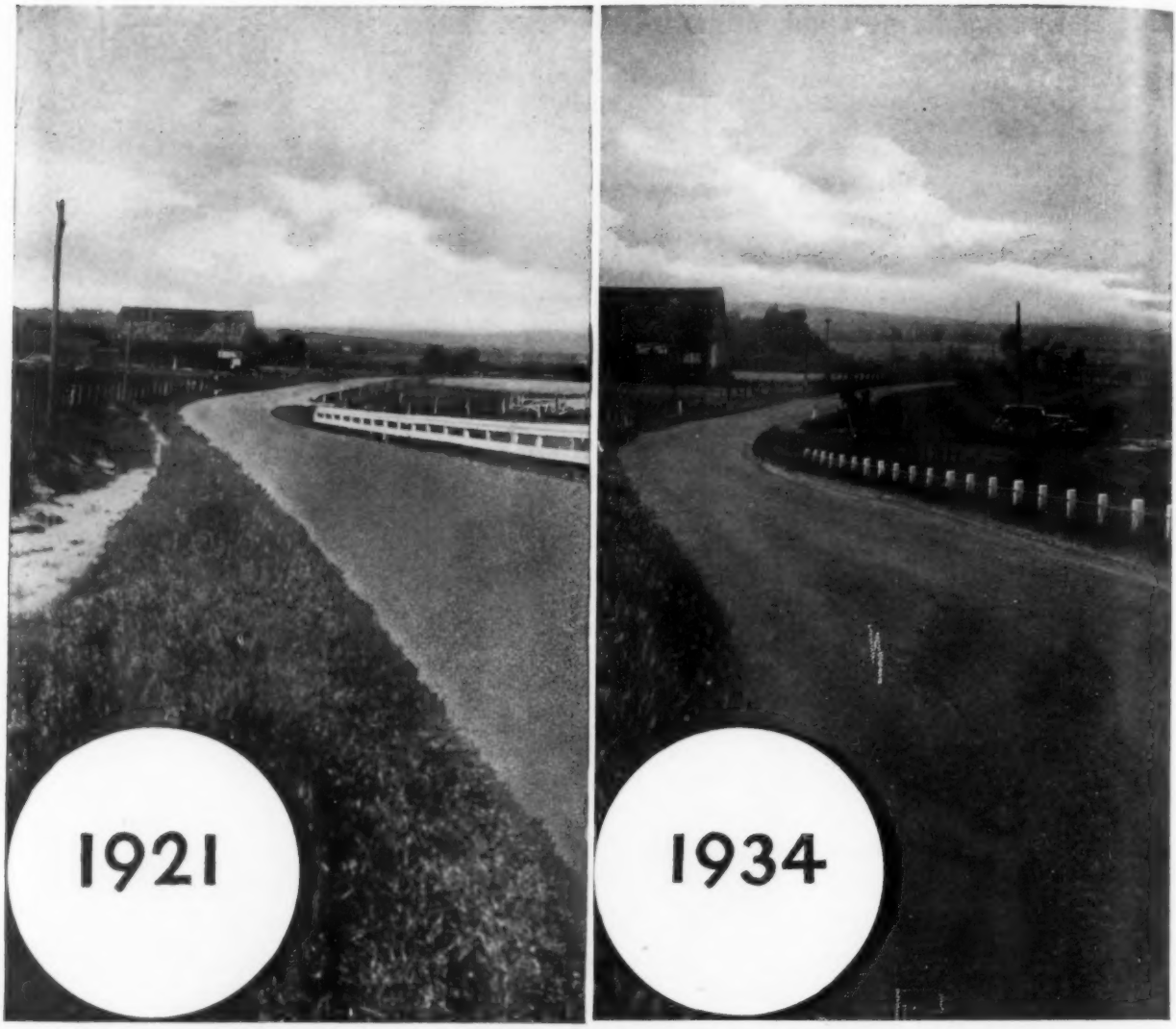
The Park Department has carried out miscellaneous projects in ten park areas totaling $212,000. These projects included road work, grading, terracing, landscaping, buildings, general development, and the completion of the Municipal Rose Garden. The last named was started under the city's direct relief program almost a year ago. All plans for these projects had been prepared previously as a part of the master park plan, and all work has been done accordingly. Another item of $39,000 covered the development of a new golf course in Rockwood Park.

The school ground beautification program, however, has been the largest of the projects. Owing to the fact that the School Board had voted four millions of bonds floated through the RFC for buildings, sites, development, and improvements of the school system, which included $65,000 for landscaping, the CWA allotted the School Board $445,000 for school ground beautification. This program is being carried out under the direction of the Park Department and includes nine projects, all but two of which will be completed by May 1. The organization for this work has been built entirely from CWA employees, including 75 engineers, draftsmen, architects, contractors, builders, and construction foremen in addition to the common labor. All surveys, topographical maps, and plans have been prepared by this organization under the direction of Hare & Hare, landscape architects, of Kansas City, who as consultants for the Park Board for the last eight years prepared Fort Worth's master park plan. When the entire school building and beautification program is completed, there will have been added to the city approximately fifty recreational centers, which are provided for in the master park plan and have been made possible at this time only through the New Deal.

Other CWA projects in the city and county include the following: widening



MUNICIPAL ROSE GARDEN, ROCK SPRINGS PARK, FORT WORTH, TEXAS; AND (BELOW) THE REFECTORY IN FOREST PARK ZOO



U. S. Highway No. 41, Marquette County, Michigan. Tarvia-built in 1921, while Woodrow Wilson occupied the White House. Photo at left was taken in 1924; photo at right shows present condition of the road.

TARVIA roads cost little to build, and require only the most inexpensive maintenance. They are easy-riding and skid-safe, and can be built to match any traffic load—at costs which assure maximum mileage of good roads from the road appropriation. Call in the Tarvia field man and give your road program the full advantage of The Barrett Company's thirty years of successful paving experience. 'Phone, write or wire our nearest office.

Barrett Tarvia
GOOD ROADS AT LOW COST

THE BARRETT COMPANY New York Chicago Birmingham Philadelphia Minneapolis Boston Cleveland Detroit St. Louis Buffalo Lebanon Baltimore Providence Bethlehem Columbus Syracuse Rochester Youngstown Hartford Milwaukee Toledo Cincinnati Portland, Me. In Canada: THE BARRETT COMPANY, LTD. Montreal Toronto Winnipeg Vancouver

waterways; extension of sewer and water lines; airport improvements; Water Board projects; levee projects; health projects; county recreational areas; county lateral road projects; fish-hatchery improvements; and many beneficial surveys on school, health, and social conditions.

These various works have employed an average of 6,400 people working from twenty-four to thirty hours a week at wages ranging from 40 cents an hour for unskilled labor to $1.12½ for skilled labor and craftsmen. Practically all the idle trucks in the county and hundreds of teams have been in use during part of this period.

CWA as administered in Fort Worth and Tarrant County has accomplished permanent improvements, the effects of which will be evident for years to come. Not the least of these accomplishments has been the rehabilitation of the morale, lives, and homes of the thousands of capable men and women who have participated.

H. J. ADAMS,
Superintendent of Parks.

Honoring the Outstanding Citizen

EAST ORANGE, N. J.—The Outstanding Citizen award is a regular feature of the annual dinner of the Chamber of Commerce and Civics of the Oranges and Maplewood. On February 21 of this year the award was made to Peter A. Smith, of South Orange, in recognition of his many activities of community and relief character, which have had widespread influence in the present recovery movement. Mr. Smith's remarkable record of accomplishment made the selection this year a relatively simple matter. The award was made for the first time at the annual dinner in 1933 and was bestowed upon Francis F. Lucas, of East Orange, in recognition of his accomplishments in the application of ultra-violet light in photo-micrography.

Each year, some time prior to the date of the annual dinner, the Chamber calls for nominations of residents who for one reason or another are considered eligible for the award. Any one in the community can send nominations, and any one living or working within the Chamber's territory may be nominated. Full details of the accomplishments for which the candidate is nominated are required, and all nominations and details are placed in the hands of the Award Committee for consideration. Shortly before the annual dinner, it is determined who is to receive the award, but no announcement of the decision is given out until it is made from the speakers' table at the dinner, which is always largely attended and is the most prominent community event of the year.

The Chamber has recognized that in its community there are many citizens working quietly, without any publicity, and accomplishing things of far-reaching benefit to the community, the state or the nation. These people, it is felt, should be given some kind of public recognition, and in order to accomplish that purpose the award was established. No diploma or cup is presented in connection with it. It consists of the public announcement of the person who has been chosen from the entire community for the recognition, and the recitation of the accomplishments of the Outstanding Citizen.

In making the award the Chamber has called attention to the difficulty of selecting any one person for this honor, due to the many diversified activities that are being carried on. Final choice indicates the person who in the judgment of the committee has through his efforts brought the greatest amount of benefit to the greatest number of people.

The awards already made have received widespread public approval and this annual event is looked forward to with keen interest by every one in the community.

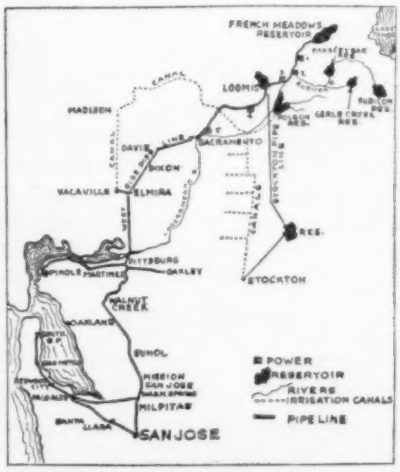
A. EDMUND WILLIAMSON,
Executive Secretary, Chamber of Commerce and Civics of the Oranges and Maplewood.

A $50,000,000 Water-Supply Project in California

SAN JOSE, CALIF.—Many California cities will be supplied with better water for domestic and industrial uses if present plans materialize.

The city of San Jose has entered into contract with the Water Properties Company, Ltd., of San Francisco, to provide the city water from the head waters of the American River in the vicinity of Lake Tahoe. The agreement is for thirty years, during which time the municipality will acquire title to the local distribution system and receive a proportionate share of the production and transmission systems. Similar agreements are to be offered to some forty cities located in a district which contains the cities of Sacramento, Stockton, Palo Alto and Redwood City.

The Water Properties Company, Ltd., reserves the right to produce and sell electrical energy for the period of the Federal license. The project is designed to provide 540 second-feet of water for domestic and industrial purposes and, during construction, will provide labor for upwards of ten thousand men for a period of two years.



HOW NEW WATER IS COMING TO SAN JOSE

The whole project, involving 50 million dollars of construction, has been included in an application to the Federal Emergency Administration of Public Works for a loan in conformity with the National Industrial Recovery Act. Negotiations were handled on behalf of the city of San Jose by Al M. Meyer, President of the City Council, and Archer Bowden, City Attorney. The Water Properties Company, Ltd., was represented by F. M. Chrisman, its General Manager, and Edward J. Bloom, its Counsel.

C. B. GOODWIN,
City Manager.

Master Plan for Huntington

HUNTINGTON, N. Y.—There are only five incorporated villages within the 90 square miles which make up the town of Huntington, and there are remarkable possibilities in master planning. Fortunately, it is not too late for the kind of procedure presented in the Master Plan and Report published in June, 1933.

The Plan comprises in general a comprehensive thoroughfare system and recommendations for a park system. Several of the projects represented have been considered by the Board of Trustees for execution in the near future or as soon as the financial situation will permit. They include new streets in the built-up district of Huntington Village and also some park improvements. A very important improvement which has occurred as a result of the Master Plan is the new traffic thoroughfare parallel to the Long Island Railroad, known as the Pulaski Boulevard. This was adopted by the county, and about half of it has been constructed. The construction of the rest of the highway will soon begin, aided by PWA funds. A small portion of the Boulevard traverses already existing city streets, but most of it is entirely new highway.

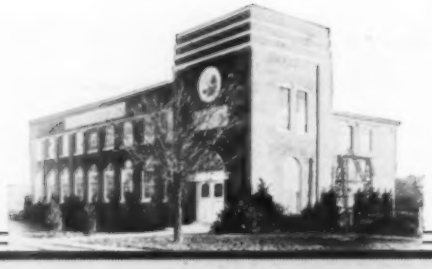
The Master Plan of Huntington emphasizes the value of planning a complete thoroughfare system for a town before it is overrun by metropolitan traffic and development. It also indicates the value of subdivision control. Particular emphasis is placed on the prompt acquirement of shore and waterfront land for park purposes.

RICHARD SCHERMERHORN, JR.
City Planner.

Survey of Unused Lands

A detailed survey of unused lands is being conducted by the Delaware County Park Board, Media, Pa. The purpose of the survey is to determine the suitability and availability for park purposes, both present and future, of the areas recommended by the Tri-State (Pa., N. J., Del.) Regional Planning Federation. All the land in the county is being studied by the engineers who were supplied by the CWA. Edwin H. Skirving, Jr., is the engineer in charge of the work. It is believed that this is the first survey of its kind to be conducted in the Tri-State Region.

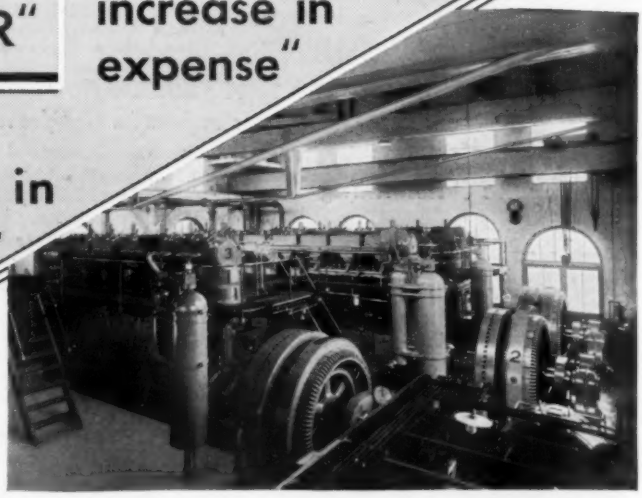
WM. S. CANNING,
Member, Delaware County Park Board.



"The Average Customer now receives 2⅓ times MORE ELECTRICITY FOR HIS DOLLAR"

"OUTPUT INCREASED 135% with only 9% increase in expense"

"LOWEST average rate in MASSACHUSETTS"



So writes Leland D. Wood, Manager, Hudson Light & Power Department—in his official report to the Commissioners, dated December, 1932.

. . . and further let it be said that the cost of modernizing Hudson's fine power center was fully paid and a comfortable surplus set aside for future expansion . . . all out of the earnings from

In 1928—Two 8-cylinder 900 h. p. and one 6-cylinder 975 h.p. Diesel . . . in 1932—One 6-cylinder 1200 h. p. Diesel.

McIntosh & Seymour Diesel Engines

Based on the above low rates and ultimate profit from the investment in the first three M-S Diesels, there could be but one logical choice when in 1932 the demand for more Kw. hours had to be met.

This Hudson record is typical of M-S Diesel performance, not only for municipal use, but in mills, mines, quarries, industrial and public buildings.

Today's M-S standard Diesel engines, mechanical injection, fully enclosed, in capacities 150 to 1600 h. p. and up, are more efficient than any prime mover we have produced during our 48 years devoted to engine building.

Wherever the consumer's dollar must be reckoned with . . . whether for light, water, tax rates or to help lower the power cost in a manufactured product, responsible executives will do well to ask "just what will M-S Diesels do for us?"

Our engineers accept the challenge to lay before you convincing evidence of savings on your particular power problem. Ask for Bulletin No. 151. It's new.

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Late News from the FERA and PWA

*Relief Programs for Places of Less Than 5,000 Population**

THE policy to govern the rural relief program which replaced CWA and direct relief in rural areas April 1 was announced by the Federal Emergency Relief Administration on March 23. Rural areas are defined as open country and towns having less than 5,000 population. Where such communities are definitely industrial, State Relief Administrators, within their discretion, may apply the urban relief policies. The statement says in part:

"The objective of the rural program is to make it possible for destitute persons eligible for relief to sustain themselves through their own efforts. . . . The new policy requires that those not able to obtain employment be reinvestigated to determine their need. Before granting relief, the administrative officials should be certain of the applicant's inability to utilize other resources, and grant relief with the understanding that it is extended only in the transitional period pending the applicant's becoming self-supporting.

"State emergency relief administrations will be permitted ample discretion as to methods employed in carrying out this program within the limits of funds available and to the extent that it can be shown that capital goods (domestic livestock, poultry, etc.) or subsistence rations and other necessities furnished will lead to the rehabilitation of the persons receiving them.

"The first phase of the program is the removal from relief rolls of all persons who can support themselves from other sources. To this end, as of April 1, 1934, case records of persons in rural areas will be closed, and persons desiring assistance will be required to register at the nearest relief office.

"Work projects, which may be a continuation of unfinished-preferred civil works projects now under way, shall be provided as a means of affording work in exchange, either for advances of food and/or other consumable items or for capital goods furnished for self-sustaining purposes. In exceptional cases approved by state emergency relief administrations, payment for work may be made in cash instead of in kind.

"Work shall be valued on the basis of the prevailing wage scale, but in no event at less than 30c per hour.

"Hours per week shall not exceed 24, except where capital goods are being worked out, in which event total hours necessary to discharge the obligation therefor incurred should be allocated by the local administrator in the most feasible manner.

"Funds for material, supervision, transportation, etc., may be provided from the gross allotments made to state relief administrations to carry out the rural rehabilitation program.

"A home garden is possible to almost every family living either in the country or in towns of 5,000 or less population. Without reference to other self-sustenance measures which may be put into effect later, it should be the policy of state emergency relief administrations to refuse to extend relief to any family failing to plant and properly care for an adequate garden when the facilities therefor are available."

* For information regarding Work Programs for larger places, see pages 7 and 42 of this issue.

PWA Technical Board of Review Enlarged

THE appointment of three additional members of the PWA Technical Board of Review has been announced. The new members are Clifford W. Ham and Carl H. Chatters, of Chicago, and R. E. Lee Taylor, of Baltimore. The two Chicago appointees are experts in the field of municipal finance, while Mr. Taylor is an outstanding architect.

The Technical Board of Review, of which Major Carey H. Brown is Acting Chairman, was created by Public Works Administrator Ickes to serve in a quasi-judicial capacity and to consider projects of a particularly difficult or of a controversial nature. It is composed of a group of outstanding engineers and technicians.

Inspection of State and Local Road Projects

SUPERVISION and inspection of road projects of states and counties financed by PWA have been transferred from the PWA Inspection Division to the U. S. Bureau of Public Roads, Administrator Harold L. Ickes announced last month.

A double purpose is served by this arrangement for road supervision. It turns over to the Bureau of Roads a job for which it is well equipped, and at the same time permits the PWA Inspection Division to devote more time to other non-Federal construction projects. The move also was in the interest of economy, since the Bureau of Roads already has in the field its regular force of district engineers in close touch with road construction, so duplication of effort and personnel by two Federal agencies will be avoided.

The Project Division of PWA has transferred to the Bureau of Roads lists of states and county road projects for which PWA has allotted as loans and grants more than $31,000,000. These allotments are for projects in addition to those financed from the original $400,000,000 for roads, which was equitably divided among all the states. The Bureau of Roads has supervised the expenditure of this fund from the beginning.

PWA, through its own field engineering and inspection forces, will continue to supervise and inspect streets, street improvements and road improvement projects in cities, towns or municipalities financed by PWA.

PWA Sells Municipal Bonds at Premiums

THE first sale by the Government of municipal bonds was made last month, when thirty-one bids, mostly at premiums, were received for five blocks of municipals of a par value of $737,000 offered by PWA. The securities were acquired by PWA to finance qualified local governmental public works when private finance failed to function. PWA has contracted to purchase upward of half a billion dollars' worth of such securities. These may be sold later at the discretion of the Administration. With the exception of one block of 4½'s, the bonds sold last month pay 4 per cent interest.

Housing Corporation Has $123,670,500 Available

TRANSFER to the Public Works Emergency Housing Corporation of $23,670,500 previously allotted to seven low-cost housing and slum clearance projects was announced last month by Public Works Administrator Harold L. Ickes. The housing corporation now has $123,670,500 available for housing and slum clearance projects.

In order to make the transfer it was necessary to rescind housing allotments previously made to Brooklyn, N. Y.; Hutchinson, Kans.; Cleveland, Ohio; Indianapolis, Ind.; Atlanta, Ga.; and Chicago, Ill. This does not mean, however, that all these projects have been abandoned by the PWA. Some projects considered suitable and practicable may be constructed either by the housing corporation or by the Administrator.

In every case, except that of Hutchinson, Kans., the allotments were rescinded because the local interests sponsoring the project failed to meet the PWA requirements as to equity after the allotment was made. In the case of the Hutchinson Suburban Housing Association the applicant failed to execute the contract.

50 Electric Plants Have Had $24,700,000 PWA Awards

OF $128,860,000 allotments by the PWA to March 25 for power generating and distributing plants, $24,700,000 has been allotted to 50 non-Federal projects. Among the large municipal allotments for power projects are a loan and grant of $1,250,000 to Augusta, Ga., for a hydro-electric plant; a loan and grant of $2,600,000 to Knoxville, Tenn., for a central substation and distributing system; a loan and grant of $738,000 to Fort Collins, Colo., for a generating plant and distributing system; and a loan and grant of $700,000 to Moberly, Mo., for a generating plant and distributing system.

Your Guarantee

of an unfailing source of water supply, available at all times, for all emergencies.

An Elevated Steel Tank

SUPPOSE your pumping station ceased operating, even for a very short time, due to breakdown or power failure. Such things happen, without warning. Where would you be without water available at gravity pressure from elevated storage.

Where would your citizens go for water for domestic needs? What would the hospitals do? Or the homes burdened by illness?

Suppose a fire should break our. It would spread unchecked, causing untold injury and damage.

You cannot permit such a possibility to exist. Arrange for adequate elevated storage. Write immediately for our Moden Water Storage Catalog, and request a visit by one of our representatives. He can tell you what amount of storage you need; where it should be located; and whether the storage should be in an elevated tank, a steel reservoir or a standpipe. He can also give you an estimate of the cost of the project.

Pittsburgh-Des Moines Steel Company

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1217 Praetorian Bldg., Dallas, Tex.
619 Rialto Bldg., San Francisco, Cal.
3120 L. C. Smith Bldg., Seattle, Wash.

Improving Municipal Administration

Current Items from the Public Administration Clearing House

Municipal Scrip Aids City Financing

MUNICIPAL scrip, properly secured, is a success.

Carl H. Chatters, Executive Director, Municipal Finance Officers' Association, makes this statement in the March issue of *Public Management*. His conclusions are based on reports from approximately 40 cities which have used municipal scrip during the past year.

Stamped scrip, or self-redeeming scrip, has not shown such favorable results, reports indicate. To redeem stamped scrip requires the equivalent of a sales tax, because the funds to retire the scrip are obtained from the sale of stamps which must be affixed when the scrip passes from one person to another.

No single outstanding instance of the success of this form of scrip has been found. Six Iowa counties which used this kind of scrip have announced that they must now issue bonds to redeem it.

"Scrip appears to have been used with success where it was properly secured by taxes and was acceptable in payment of taxes and other claims due the municipality," Mr. Chatters says. "Forced into use by the inability of cities to obtain short-term bank credit, scrip may become a means of financing for many years to come."

Twenty-eight million dollars worth of scrip was issued by the city of Detroit in 1933. All of it was redeemed at maturity. Wisconsin cities issued scrip given them by the state banks in exchange for municipal tax notes. The banks received the scrip from customers for deposit or in payment of amounts due the banks. The city of Royal Oak, Mich., has been using scrip for one-half of its municipal salaries for approximately three years. All scrip was redeemed on the due date, if not received for taxes before that time.

City Purchasing Under the Codes

CAUGHT between two fires, American cities are feeling the influence of the National Industrial Recovery Act codes in their purchasing in a way they had not foreseen. On one side taxpayers ask for economy in budget making. On the other, application of codes, which has resulted in collective price fixing, has increased prices of supplies for city use to an almost prohibitive point.

"A number of cities have had unfortunate experience with buying from manufacturers and industrialists working under the code," says Paul V. Betters, Secretary, United States Conference of Mayors, and Executive Director, American Municipal Association. "Bids submitted on supplies in some cases apparently have been collusive, showing a uniform high price which is 'blamed upon' the NRA. This leaves the cities without protection."

As a solution, the 5,000 cities represented in the United States Conference of Mayors and the American Municipal Association propose that they be given the privilege of assisting in determining what is a reasonable price for their supplies. They also believe that provision should be made in all codes to permit states, counties and cities to impose their own terms of payment. At present, terms of payment specified in some of the codes conflict with existing laws governing payments on city purchases and contracts.

The cities feel that the codes may well provide for a decrease in price proportionate to the size of the orders, both individual and collective, extending over a period of time, such as an agreement to purchase a definite quantity within a stated period. They point out that in addition to the reduction in manufacturing costs due to the handling of a single bulk order, the vender realizes marked savings on handling and bookkeeping.

"Cities realize that there must be some rise in prices under the NRA codes, benefits of which they recognize," says Mr. Betters. "But they know their budgets will not stand such sharp increases as have shown up recently in prices quoted under the codes."

Fair Pay for Municipal Employees—A Six-Point Formula

THE recent action of the United States Senate on salary restoration for Federal employees draws attention to the situation in many municipalities, where employees are being asked to take further salary reductions, rather than having their former pay restored. Budget-cutting is still the reason.

Fair play for public employees has not been standardized by cities.

Dr. Lent D. Upson, Director, Detroit Bureau of Governmental Research, in the March issue of *Public Management*, official journal of the International City Managers' Association, prescribes a six-point formula for a fair pay basis:

1. To put public service employees on a strict merit basis which should be determined by job analysis, intelligence and personality tests and service ratings. To promote employees on the same plan.

2. To recruit workers in public service from the public schools and colleges. To train these recruits for their jobs while they are in service.

3. To classify all positions in public service under a few heads—five or six—giving equal pay for all employees in the same class and in corresponding classes that require similar training and ability.

4. To pay an employee the full compensation of his class after he has had a short probationary period—not granting him a bigger salary as his time in service lengthens, since his public service job is either learned in six months or not learned at all.

5. To fix salaries of the various classes according to the income of the social group to which the employees belong, as a class.

6. To change salary rates as the value of the dollar and the standards of living change.

Municipal Light Plant Managers

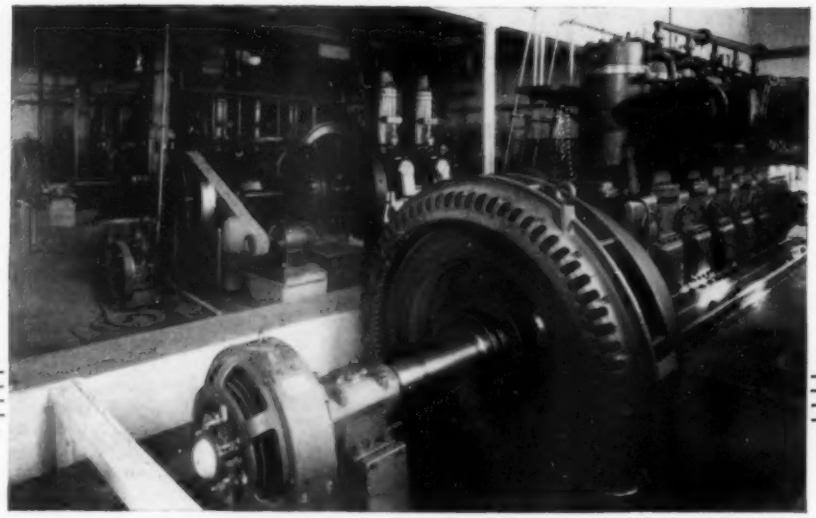
RUNNING a municipal electric light plant is an important public service in over 1,800 cities in the United States. Yet only two-thirds of these plant administrators have had any general education above grammar school, according to a study, "Municipal Electric Plant Managers," just published by Public Administration Service, Chicago, which gives information about 690 of them.

Although managers are expected to be technically responsible persons, only occasionally, according to the men holding the jobs, do city charters specify an engineer as plant manager. Few, also, are selected by civil service or any formal tests of qualification. Less than one-tenth of the managers have attended colleges of engineering, correspondence schools most frequently being the source of their technical training. Except in cities with over 10,000 population, nearly half the managers in several sections of the country have had no technical training.

Prior experience of the right kind may be a substitute for technical training, the author, Edna C. Macmahon, points out. At present, however, light plant managers in small communities have in many cases been farmers or business men before. In larger cities, they have usually been engaged in industrial or electrical work previous to becoming managers.

There is a need for professionalizing these jobs, the author points out. This would make possible exchange of managers among cities, which is the case with only one-tenth of them now, according to the survey. Tenures of reasonable length, fostered by adequate salaries, and freedom from unfavorable political influence are among elements necessary to build up these professional standards.

Wide differences in salary, tenure, duties and powers of the plant managers in various cities at present are indicated in the survey.



Sebewaing's power plant as it is today. All are F-M Diesels

SEBEWAING, MICHIGAN, BEGAN WITH 50 H.P.—*NOW HAS 1015 H.P.* F-M Diesels

THAT plentiful power at low rates is an important factor in a city's growth, has long been an acknowledged fact. But over 350 cities generating their own power with F-M Diesels have proved that these engines further enhance city prosperity by keeping the profits at home.

Back in 1911, Sebewaing, Michigan, established its own light plant with a 50 h.p. F-M Engine. Today this same city has four F-M Diesels totaling 1015 h.p. Through 23 years of municipal light plant experience this city has employed F-M Engines exclusively.

Also during these years, outside interests on two occasions have seen the profit opportunities in Sebewaing's plant and have made attempts to purchase the plant. Wisely, the city has preferred to control its own power producing facilities and keep the profits for the city.

The story of this city is a familiar one in the records of municipalities using F-M Diesels. It is a story of lowered rates and expansion made possible by the profits which these engines make.

City officials and interested citizens may take the first step in securing these benefits for their city by securing further factual information on the part F-M Diesels are playing in civic progress, by writing Fairbanks, Morse & Co., 900 S. Wabash Ave., Chicago, Ill. 32 Branches at your Service Throughout the United States.

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Progress in Regional and State Planning

Twelve Planning Regions Established

TO aid the National Planning Board in the coordination of interstate and regional planning proposals into a carefully considered longer-range program, Public Works Administrator Harold L. Ickes has divided the country into twelve planning regions, grouping states from the standpoints of primary drainage, land use and transportation interests.

THE TWELVE PLANNING REGIONS

Appointment of District Chairmen for eight of the regions was announced on March 11. These are:

George L. Radcliffe, Baltimore, Md., District No. 3, composed of Maryland, Virginia and North Carolina.

Henry T. McIntosh, Atlanta, Ga., District No. 4, composed of South Carolina, Georgia, Alabama and Florida.

Alfred Bettman, Cincinnati, Ohio, District No. 5, composed of Ohio, Indiana, Kentucky, West Virginia and Tennessee.

Charles M. Moderwell, Chicago, Ill., District No. 6, composed of Michigan, Illinois, Wisconsin, Minnesota and Iowa.

Vincent M. Miles, Fort Smith, Ark., District No. 7, composed of Arkansas, Louisiana, Mississippi and Oklahoma.

J. C. Nichols, Kansas City, Mo., District No. 9, composed of Missouri, Kansas, Nebraska, Wyoming and Colorado.

Marshall N. Dana, Portland, Ore., District No. 11, composed of Washington, Oregon and Idaho.

Duncan McDuffie, San Francisco, Calif., District No. 12, composed of California, Arizona, Nevada and Utah.

The New England States will comprise District No. 1; New York, New Jersey, Pennsylvania and Delaware, District No. 2; Montana, North Dakota and South Dakota, District No. 8; and Texas and New Mexico, District No. 10.

It will be the duty of the District Chairmen to stimulate interest in city, state and regional planning and to assist the National Planning Board to coordinate state planning. They will be the contact between the National Planning Board and state planning units, official or voluntary.

Regional planning commissions are functioning in New England and the Pacific Northwest. George W. Lane, Jr., is acting chairman of the New England group, which is composed of William L. Slate, New Haven, Conn.; Samuel Stewart, Lewiston, Maine; Capt. James M. Langley, Concord, N. H.; James H. Cady, Providence, R. I.; George Z. Thompson, Proctor, Vt.; Victor M. Cutter, Newton, Mass.; and Mrs. Charles Sumner Bird, Walpole, Mass.

The Northwest Regional Planning Commission is headed by Mr. Dana, who also is PWA District Chairman for this territory. Other members of the Commission are Judge Charles M. Thomas, representing Oregon; E. F. Banker, Washington; J. S. James, Montana; and E. A. Cox, Idaho.

Chairmen and Consultants of State Boards

THE following appointments have been announced by the National Planning Board up to March 31, 1934. Where a state name only is given, a State Planning Board has been appointed but the name of Chairman was not available when this issue went to press:

ALABAMA
Chairman, Dr. L. N. Duncan, Alabama Polytechnic Institute, Auburn

ARIZONA

ARKANSAS
Chairman, George W. Donaghey, former Governor, Little Rock
Consultant, Earl O. Mills, 198 Railway Exchange Bldg., St. Louis, Mo.

CALIFORNIA
Chairman, John C. Austin, Architect, Los Angeles

COLORADO
Chairman, John T. Barnett, First National Bank Bldg., Denver
Consultant, Irvin J. McCrary, 130 State Office Bldg., Denver

CONNECTICUT
Chairman, W. L. Slate, Director, Connecticut Agricultural Experiment Station, New Haven
Consultant, George H. Gray, 6 Prospect Court, New Haven

FLORIDA
Chairman, Fred C. Elliot, Tallahassee

GEORGIA
Chairman, Cason J. Callaway, La Grange

IDAHO
Chairman, Eugene A. Cox, Lewiston

ILLINOIS
Chairman, Robert Kingery, Director of Public Works, Springfield
Consultant, Jacob L. Crane, Jr., care Col. H. L. Kellogg, Administration Bldg., Garfield Park, Chicago

INDIANA
Chairman, John J. Wheeler, Highway Department, State House Annex, Indianapolis
Consultant, Lawrence V. Sheridan, 217 N. Senate Ave., Indianapolis
Associate Consultant, R. W. Blanchard, (same address)

IOWA
Consultant, S. Herbert Hare, 114 W. 10th Street Bldg., Kansas City, Mo.
Consultant, P. H. Elwood, State College, Ames, Iowa

KANSAS
Chairman, Walter Innes, Wichita
Consultant, S. Herbert Hare, 114 W. 10th Street Bldg., Kansas City, Mo.
Associate Consultant, Samuel Wilson, Topeka

KENTUCKY
Chairman, H. St. George Tucker Carmichael, Member State Advisory Board, Kyrock
Consultant, L. Segoe, 35 E. 7th St., Cincinnati, Ohio

MAINE
Chairman, Samuel Stewart, Lewiston
Consultant, Arthur C. Comey, Harvard Square, Cambridge, Mass.
Associate Consultant, Alfred Mullikin, State House, Augusta

MARYLAND
Chairman, Abel Wolman
Consultant, Irving C. Root, County Bldg., Silver Spring

MICHIGAN
Chairman, Claude S. Carney, Department of Labor and Industry, Lansing
Consultant, Jacob L. Crane, Jr., Wrigley Bldg., Chicago, Ill.
Associate Consultant, Walter H. Blucher, Water Board Bldg., Detroit

MINNESOTA
Chairman, Dean R. W. Selvidge, Missouri University, Columbia

MISSOURI
Chairman, Prof. R. W. Selvidge, Missouri University, Columbia
Consultants, Harland Bartholomew, 317 No. 11th St., St. Louis; S. Herbert Hare, 114 W. 10th Street Bldg., Kansas City

MONTANA
Chairman, Governor Frank H. Cooney, Helena

NEBRASKA
Chairman, William H. Smith, Chairman, State CWA Com. and Federal Emergency Relief Com., Lincoln

NEVADA

NEW HAMPSHIRE
Chairman, James H. Langley, Concord
Consultant, John Nolen, Harvard Square, Cambridge, Mass.
Associate Consultants, Justin Hartzog, Harvard Square, Cambridge, Mass.; Geoffrey Platt, 101 Park Ave., New York

NEW JERSEY
Chairman, Charles P. Messick, Secretary, Civil Service Commission, Trenton
Consultant, Russell Van Nest Black, 90 Nassau St., Princeton
Associate Consultant, Bernard B. Eddy, 206 W. State St., Trenton, N. J.

NEW MEXICO
Secretary, John D. de Huff, Pres., Chamber of Commerce, Santa Fe, N. Mex.

NEW YORK
Chairman, Dr. A. R. Mann, Provost, Cornell University, Ithaca
Consultant, Robert Whitten, 175 Fifth Ave., New York

NORTH DAKOTA
Chairman, S. E. Ellsworth, Opera House Block, Jamestown

OHIO
Chairman, Dean Walter J. Shepard, Ohio State University, Columbus
Consultant, L. Segoe, 35 E. 7th St., Cincinnati

OKLAHOMA
Chairman, Ed. McDonald, Secretary, State Highway Commission, State Capitol, Oklahoma City
Consultant, Earl O. Mills, 1987 Railway Exchange Bldg., St. Louis, Mo.

OREGON
Chairman, Judge Charles M. Thomas, Public Utilities Commissioner, State Office Bldg., Salem

SOUTH CAROLINA
Chairman, J. E. Sirrine, Greenville

SOUTH DAKOTA

UTAH
Chairman, Governor Henry H. Blood, Salt Lake City

VIRGINIA
Chairman, Morton L. Wallerstein, Executive Secretary, League of Virginia Municipalities, Richmond
Consultant, Irving C. Root, County Bldg., Silver Spring, Md.

WASHINGTON
Acting Chairman, B. H. Kizer, Spokane City Planning Commission

WISCONSIN
Chairman, William E. O'Brien, State Highway Commission, Madison
Consultant, Jacob L. Crane, Jr., Wrigley Bldg., Chicago, Ill.

WYOMING

NEW ENGLAND REGIONAL PLANNING COMMISSION
Acting Chairman, George W. Lane, Jr., U. S. Court House and Post Office, Boston
Consultant, Joseph T. Woodruff.

NORTHWEST REGIONAL PLANNING COMMISSION
Chairman, Marshall N. Dana, New Federal Bldg., Portland, Ore.
Consultant, Major Roy F. Bessey, 612 Post Office Bldg., Portland, Ore.

208 years old . . .

and it is still in service

Der Bürgermeister.

Photographs furnished by courtesy of Deutscher Gussrohr-Verband G. m. b. H. (German Cast Iron Pipe Syndicate), Cologne.

HERE is an unretouched photograph (with authenticating letter) of a cast iron water main which has served the German city of Ehrenbreitstein for more than two centuries. Over his official seal, the Burgomeister writes, "The water main . . . was replaced in 1726 . . . by cast iron pipes . . . and though this old main crosses the much-frequented tramway . . . and lies partly under the provincial street to Arenberg with its heavy traffic, the main required very seldom any repairs during its long time of service. On the occasion of an excavation the enclosed photographs have been made. These show the position and the good condition of the pipes."

Cast iron mains still in use after serving 100 to 200 years, and longer, have been recently uncovered and inspected in England, France, Germany and the United States. Taxpayers have saved and are saving enormous sums in taxes or rates by reason of the long life and low maintenance cost of cast iron underground mains.

The reason for the long life of cast iron pipe is its effective resistance to rust. Cast iron is the one ferrous metal for water and gas mains, and for sewer construction, that will not disintegrate from rust. This characteristic makes cast iron pipe the most practicable for underground mains since rust will not destroy it. For further information, address The Cast Iron Pipe Research Association, Thomas F. Wolfe, Research Engineer, 309 Peoples Gas Building, Chicago, Illinois.

Methods of evaluating bids now in use by engineers rate the life of cast iron pipe at 100 years minimum

CAST IRON PIPE

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TRAFFIC CONTROL AND FACILITATION

Conducted by Publications Committee, Institute of Traffic Engineers, 175 Fifth Ave., New York

Maxwell Halsey, Chairman, Harry Hemmings, Reyburn Hoffman, Benoit Laberge, Theodore T. McCroskey, Donald M. McNeil, A. J. Naquin, Hawley S. Simpson, Arthur G. Straetz, Peter J. Stupka, Lawrence S. Tuttle, John C. Wrighton

American Cities Which Made the Greatest Safety Progress in 1933

By SIDNEY J. WILLIAMS
Director, Public Safety Division, National Safety Council

NEARLY 300 American cities, with a total population of more than 40,000,000, officially entered the 1933 National Traffic Safety Contest, sponsored by the National Safety Council and supported by many local, state, and national organizations.

The cities which made "the greatest safety progress in 1933" were selected by the following three nationally known traffic experts: Thomas H. MacDonald, Chief, U. S. Bureau of Public Roads, Chairman; Miller McClintock, Director, Erskine Bureau of Street Traffic Research, Harvard University; and John E. Long, President, National Safety Council. Following are the winning cities:

1. Grand Prize award, to the city which "came the nearest to doing for traffic safety the things practicable in such a community"—Evanston, Ill.

2. First Prize winners in the seven population groups: Group I, Milwaukee, Wis.; Group II, Providence, R. I; Group III, Grand Rapids, Mich.; Group IV, Evanston, Ill.; Group V, Fond du Lac, Wis.; Group VI, La Grange, Ill.

3. The committee also selected, for each of the seven groups, Second Place and Third Place winners, and cities given Honorable Mention awards. On this page is a complete list of the winning cities.

The 1933 National Traffic Safety Contest was especially significant because it followed a like contest conducted during the previous year, in which a large percentage of the same cities participated; and it is being followed during 1934 by a third annual contest, with a large increase in city enrolment.

Continued Benefits of Previous Contests

To demonstrate, if possible, the accident prevention results from the original 1932 contest, a careful study was carried through by the National Safety Council, contrasting safety results in cities which entered the contest with cities which did not enter. The 130 cities which filed reports complete enough for the study showed a reduction of 16 per cent in traffic deaths, as compared with a reduction of 9 per cent in all cities which reported to the U. S. Census Bureau. Also, the 70 cities which were given awards in the 1932 contest averaged a reduction of 23 per cent for the year; and the cities in the contest which received the highest scores for safety activities made the greatest reduction in their accidents. The Council will make a like comparative study of the cities which were in the 1933 contest.

The grading schedule for selecting the 1933 contest winners was about the same as for the previous annual contest. This schedule was so planned that no city could win either through a lucky accident record alone, or through a paper program that produced no real results in traffic safety. The contest recognized two kinds of safety accomplishments: first, a low death rate from motor-vehicle accidents, or a lowering rate as compared with previous years; second, such a setup of traffic regulations, administrative machinery, and educational activities as generally brings improved accident control. The specific items of the grading schedule were:

A. Accident record—50 points
B. Accident reporting—5 points
C. Traffic engineering—10 points
D. Traffic law enforcement—15 points
E. Child safety—10 points
F. Public education—10 points
G. Community safety organization—10 points

Activities in the Winning Cities

Following are brief statements about the winning city in each of the population groups:

Milwaukee, with a motor-vehicle fatality record equaled by almost no other large city, demonstrated what a city can do if it wants to. Traffic engineering and law enforcement are intelligently and efficiently handled. The educational work for safety in the schools, under William C. Knoelk, Assistant Superintendent, is remarkably effective. And of tremendous importance is the work of Dr. B. L. Corbett, Secretary of the Milwaukee Safety Commission, a municipal organization.

Providence, R. I., in the population group 250,000 to 500,000, reduced motor-vehicle fatalities from 36 in 1930 to 21 in 1933. The program was directed by Ralph W. Eaton, Traffic Engineer, and H. K. Bennett, Manager, Safety Department of the Automobile Club of Rhode Island. The program included systematic speed checks and other traffic studies at 54 city points. About 100 safety playlets were written and presented by children in the schools. Fifty-six police cars were equipped with radio receiving sets for follow-up of traffic accidents.

Grand Rapids, Mich., in the population group 100,000 to 250,000, reduced its traffic fatalities from 29 in 1930 to 9 in 1933. The program was directed by H. Fred Altman, Chairman, City Traffic Committee, and E. Ross Farra, Manager of Grand Rapids Safety Council. Effective work was done by the Special Traffic Squad of the Grand Rapids Safety Council, composed of 51 prominent business men deputized as city traffic constables and deputy sheriffs. Nearly all schools have Junior Safety Squads, and there was a vigorous "all-year" public safety program.

Evanston, Ill., in the population group 50,000 to 100,000, one of the two Grand Prize winners in 1932, reduced its traffic fatality rate and improved its traffic control methods. The "ticket fixing" problem was improved, all traffic signs were either reconditioned or improved, an accident clinic for repeaters was established and accident investigation squads were continued. The program was directed by Frank M. Kreml, Director, Accident Prevention Bureau, Police Department, and F. J. Cody, President, Evanston Safety Council.

Fond du Lac, Wis., in the population group 25,000 to 50,000, had only one traffic fatality. The safety program was directed by E. H. Knueppel, President, Fond du Lac Safety Council, and Otto R. Domroehs, Lieutenant of Police. There were 206 traffic summonses and arrests in 1933 and 156 convictions. The program included a safety month in September, and a drive to improve automobile headlights.

LaGrange, Ill., in the population group 10,000 to 25,000, had no traffic fatalities in 1933. The safety program was directed by George H. Berry, Chairman, Safety Committee, LaGrange Civic Club, and Harry McInnes, Chief of Police. There were many traffic engineering improvements, and a remarkable record of 387 traffic summonses and arrests during the year, which resulted in 387 convictions. The police conducted a special traffic courtesy campaign during the summer period of the Chicago Century of Progress.

Here is a complete list of the winning cities:

GROUP I
Milwaukee 1st
Pittsburgh 2nd
Boston 3rd
Honorable Mention
Cleveland
Detroit

GROUP II
Providence 1st
Rochester 2nd
Oakland 3rd
Honorable Mention
Dallas
Houston
Washington
Newark, N. J.

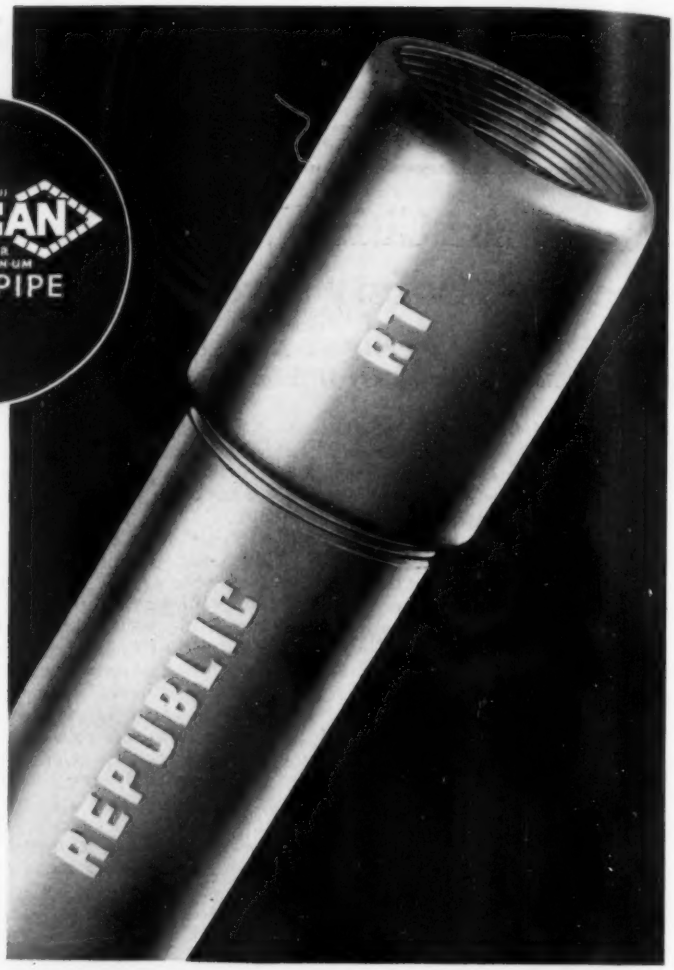
GROUP III
Grand Rapids 1st
New Bedford, Mass. 2nd
Springfield, Mass. 3rd
Honorable Mention
Syracuse, N. Y.
Elizabeth, N. J.
Wilmington, Del.
Reading, Pa.
Ft. Wayne, Ind.
Flint, Mich.
Chattanooga
Duluth
Wichita, Kans.
Erie, Pa.
Camden, N. J.

GROUP IV
Evanston, Ill. 1st
Montgomery, Ala. 2nd
Lakewood, Ohio 3rd
Honorable Mention
Berkeley, Calif.
Saginaw, Mich.
Oak Park, Ill.
Greensboro, N. C.
Austin, Texas
Madison, Wis.
Davenport, Iowa
Union City, N. J.

GROUP V
Fond du Lac, Wis. 1st
Dubuque 2nd
Chelsea, Mass. 3rd
Honorable Mention
Great Falls, Mont.
St. Petersburg, Fla.
Lynchburg, Va.
Beverly, Mass.

GROUP VI
LaGrange, Ill. 1st
Pampa, Texas. 2nd
Massena, N. Y. 3rd
Honorable Mention
Mankato, Minn.
Teaneck, N. J.
Gardner, Mass.
Parma, Ohio
Albert Lea, Minn.
Saugus, Mass.
Owosso, Mich.
Fairmont, W. Va.
Xenia, Ohio

The 1934 National Traffic Safety Contest now under way has several new features. First, the minimum population of a competing city has been placed at 5,000. The cities in this lowest population group (from 5,000 to 10,000) will not be graded on their engineering, enforcement, and educational work; but all cities in this group which go through the year 1934 without an automobile fatality will be placed on a special Honor Roll.



TONCAN IRON PLUS REPUBLIC ELECTRIC WELD . . . EQUALS LONGER LIFE IN SERVICE

There are plenty of places in buildings, in industrial plants, in mines and in marine service where the conditions of use are severe enough to make it well worth while for the buyer of pipe to spend all the time necessary to obtain a complete understanding of the relative merits of the many kinds available.

Such a comparison will bring to light the fact that Toncan Iron Pipe combines the rust-resistant qualities of a true alloy iron and the fine physical characteristics that result from the Republic electric resistance weld process.

Remember these facts when specifying or buying pipe. Toncan Iron is an alloy of refined iron, copper and molybdenum. In rust-resistance it ranks first among the ferrous metals after the stainless alloys. The finished pipe is uniform in grain structure throughout. Also, it is perfectly round, straight, uniform in diameter and wall thickness, and free from rust-promoting scale.

The experience of thousands of users prompts the statement that in Toncan Iron Pipe you will find a big plus value—longer trouble-free life and less frequent need for replacement. Write today and ask us to send you a copy of "Pipe for Permanence."

REPUBLIC STEEL CORPORATION

GENERAL OFFICES YOUNGSTOWN, OHIO

During April we hope you will remember to mention THE AMERICAN CITY

Second, states have been invited officially to enter the contest (and 31 states have enrolled). The main contest will continue to be between cities; but awards will be made to states on the basis of the highest percentage of eligible cities (or more than 10,000 population) which enroll, and the final scores of these contesting cities. A total of 444 cities have officially entered the 1934 National Traffic Safety Contest.

CWA Traffic Survey of Pittsburgh

"THE story behind the accident" is being investigated in a comprehensive accident study by CWA workers for the Bureau of Traffic Planning, Pittsburgh, Pa. All accident records involving accidents in the city over a period of three years, together with all citizen complaints of reckless drivers and law violators, are being tabulated in an accident repeater study. The percentage of drivers in two or more accidents, as well as the percentage of drivers who have been cited as law violators and were later involved in accidents, are being determined.

One result of the study will be to determine whether or not the oft cited "repeater" type of driver is as prevalent as is thought. Another result will be to determine the factual educational justification of vigilante organizations of citizens who report instances of flagrant traffic law violations. If a relationship is found between drivers who have accidents and those who are cited for violations, then the theory of vigilante organizations will be justified. It will be proved to be directed at accident causes and accident-causing drivers.

Making various types of traffic studies, 103 CWA workers have been supervised by the Bureau of Traffic Planning since January 1. All studies are to be completed on May 1.

Other accident studies include the preparation of collision diagrams at bad-accident locations to determine type of protection needed, and before and after studies at signalized corners to determine the effectiveness of equipment. Closely allied with the principle of "sharpshooting" enforcement, one study includes an office and field check on law violations and a coordination of these with accident records to determine proper routes for motorcycle patrols, and for violations to be stressed in enforcement.

One unusual study is a "Business Survey of Parking Needs." Parking rules in the past have largely resulted from the dual needs of flow and accident prevention, with but little attention paid to actual business needs.

In conducting this survey the owners of all cars parked at the curb were approached by properly identified checkers and asked their destination and the reason for the destination. Reasons were listed as: to shop, sell or work; for delivery of pick-up merchandise; or for recreation.

Submitted by DONALD M. MCNEIL,
Assistant Traffic Engineer, Pittsburgh, Pa.

A Comprehensive Program for Street and Highway Safety

IN its *Washington Review* for March 12 the Chamber of Commerce of the United States calls attention to the fact that plans for a concerted effort, with cooperation of public officials and interested commercial and civic bodies, to bring about better and safer conditions of street and highway traffic and cut down the toll of automobile accidents have been made through the National Conference on Street and Highway Safety as announced by Chairman Roper.

A comprehensive program of uniform legislation, improved administration and enforcement, adoption of new traffic engineering measures and a widespread education campaign among drivers and the general public, has been proposed by a committee of the Conference. Revision of the Uniform Vehicle Code and Model Municipal Traffic Ordinance in the light of experience in the 34 states where these standards have served as the basis for traffic laws and regulations was undertaken by another committee, and a third committee appointed sometime ago reported practical completion of a revised up-to-date code of traffic signs and signals.

The National Chamber as heretofore is taking an active part in this work.

National Chamber Urges Slum Clearance Activities

ACTING on a report by its Civic Development Department Committee, the Board of Directors of the Chamber of Commerce of the United States at its March meeting adopted a resolution dealing with the relation of city planning to housing and other contruction. The resolution reads:

"Experience over the past six months with the proposed slum clearance and housing program of the Federal Government suggests the need for careful studies by competent local planning boards of the physical, economic and social problems underlying the blighted districts in cities, which serve to drain the public treasuries. Chambers of commerce can profitably initiate or cooperate with planning activities which include the gradual elimination of such areas and the prevention of their recurrence. Practical accomplishment in these directions can reflect itself in a better city budget which will directly benefit business, and all taxpayers. By directing attention to opportunities for needed construction, repair and rehabilitation work, these local planning activities can be of immediate value in encouraging a natural and healthy revival of construction and other capital goods industries."

Recent City Manager Appointments

GUY ANCEL, formerly City Manager of Orange, Va., has recently been appointed City Manager of Hopewell, Va., to succeed Lamar Johnson, who resigned effective April 1.

G. H. Bates has succeeded Arthur R. Boring as City Manager of Plant City, Fla.

Willard F. Day, President of the International City Managers' Association, has resigned his position as City Manager of Staunton, Va., to become the first County Manager of Henrico County (Richmond), Va.

J. R. Dowd has succeeded L. P. Pape as City Manager of Moore Haven, Fla.

A. R. Hanke has succeeded J. R. Gwinn as City Manager of Gallipolis, Ohio.

Wilma D. Murdaugh has succeeded W. D. Smith as City Manager of Fort Meade, Fla. She is also acting as City Clerk.

V. C. Philyaw has been appointed City Manager of Cornelia, Ga., to succeed G. M. Sullivan.

James S. Rodney has succeeded Dorsey W. Clark as City Manager of Clarksburg, W. Va.

George J. Rohan has been appointed City Manager of Waco, Texas, to succeed E. E. McAdams, who has accepted the position of Director of the Texas League of Municipalities. Mr. Rohan is Superintendent of the Water Works and will now hold both positions.

S. R. Rowland has been appointed City Manager of Sumter, S. C., to succeed R. L. McLeod.

CLARENCE E. RIDLEY,
Executive Director, The International City Managers' Association.

The Municipal Bond Market

Recent sales of new issues, from March numbers of *The Bond Buyer*:

Amount	Borrower and Purpose	Rate (%)	Term (Years)	Basis (%)
$154,000	Newport, R. I., Sewer	3.5	12.25 Avg.	3.29
165,000	Naugatuck, Conn., Refunding	4	5-15 Ser.	3.44
377,000	Schenectady, N. Y., General, Park	3.5	5.5 Avg.	3.45
125,000	Cedar Rapids, Ia., Sewer Outlet; Purification Plant	4	4.25 Avg.	3.45
735,000	Minneapolis, Minn., Relief, Funding, Improvements	3.75	5.81 Avg.	3.56
2,098,000	Boston, Mass., Refunding	3	3	3.60
500,000	Denver, Colo., Relief	3.65	16-20 Ser.	3.63
200,000	Lynchburg, Va., Water Supply	4	10 Avg.	3.78
177,828	Hamilton Co., Ohio, Road	4	6 Avg.	3.90
630,000	Albany Port District, N. Y., Port	4	5-49 Ser.	3.96
180,000	Wilkinsburg, Pa., School	4.25	6.333 Avg.	4.24
495,000	Plainfield, N. J., Drainage, Sewer	4.75	15.75 Avg.	4.51
2,750,000	Monroe Co., N. Y., Tax Revenue, General	4.75	4 Avg.	4.65
2,168,000	Dallas, Texas, Funding	4.75	11.5 Avg.	4.74
125,000	Nutley, N. J., Assessment	5	4.5 Avg.	5
500,000	Yazoo-Miss. Delta Levee Distr., Miss., General Improvement	5	5-14 Ser.	5.30
240,000	Lorain, Ohio, Refunding	6	9 Avg.	6

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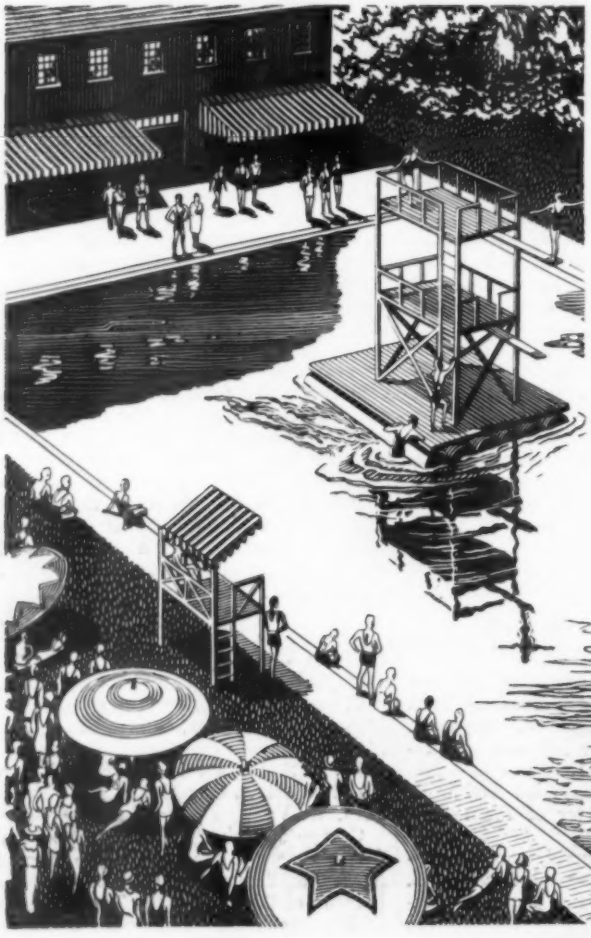

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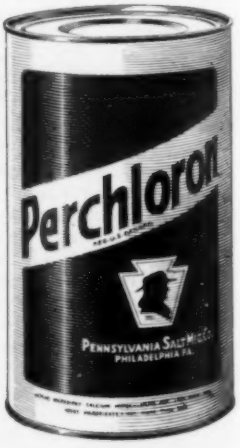

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Prepared by
FRANK B. WILLIAMS
Author of "The Law of City Planning and Zoning"

ZONING and PLANNING NOTES

From Data collected by the Zoning Committee of New York (233 Broadway)

Zoning Ordinance—Publication

CONNECTICUT.—*Town of Madison v. Kimberley*, 169 Atl. 909 (Supreme Court of Errors, January 2, 1934).—The Home Rule Act (Gen. Statutes, 1930, Sec. 390) authorizes towns to adopt by-laws on a number of subjects. By Section 391 by-laws upon these subjects cannot become effective unless published as required by this section. Among the powers enumerated in that section is that "to make rules relating to the regulation of traffic and the construction of buildings." Zoning ordinances are dealt with specifically in a separate chapter of the General Statutes. The Court holds that the provision of Section 391 requiring publication in a certain way of rules relating to the regulation of the construction of buildings does not apply to zoning ordinances, because zoning is fully dealt with in a separate chapter.

EDITOR'S NOTE.—See in this connection the Louisiana case of *State ex rel. Holcombe v. City of Lake Charles*, with note, in our February, 1933, "Notes."

Streets—Garage—Curb Pumps

IOWA.—*Incorporated Town of Lamoni v. Smith*, 251 N. W. 706 (Supreme Court, December 12, 1933).—The State Legislature had passed a statute under which the town of Lamoni was given authority "to limit the number of, regulate, license or prohibit . . . gasoline curb pumps in streets . . ." The town had enacted no ordinance under this statute.

The statutes of the state provided that the town "shall have the care, supervision and control of all public . . . streets . . . within the city, and shall cause the same to be kept open and in repair and free from nuisance." The defendant Smith had, without the permission of the town, erected a row of two pumps, in front of his filling station, between the curb and the sidewalk. Smith claimed that the town had no right to order the removal of the pumps except under the statute giving it the specific right to do so; and could not exercise that right without passing a proper ordinance under it; which it had not done. The Court upheld the contention of Smith that the town could not remove the pumps under the statute giving it the specific right to do so, but held that it could remove them under the statute giving it the care of the streets.

Outdoor Advertising

NEW JERSEY.—*Allen v. McGovern*, 169 Atl. 345 (Supreme Court, December 15, 1933).—An ordinance prohibiting the distribution of unsolicited advertising matter to householders to be placed in front of or on the steps of a house, etc., is valid.

Private Covenants—Nuisance

NEW YORK.—*Murphy v. Hitchcock*, 268 N. Y. S. 385 (Supreme Court, January 2, 1934).—Whether the maintenance of dog kennels constitutes a nuisance depends upon the character of the locality, circumstances, the reasonableness of such use, the extent of the annoyance and discomfort caused, and whether there be continuous or recurring injury. The kennels in this case were in a high-class residential neighborhood, and on the evidence were held by the Court to be a nuisance. When the properties in question were sold, the seller exacted from each purchaser covenants imposing restrictions on the use of the lots sold, for the common advantage of all other purchasers, with the design of carrying out a general scheme for the improvement of the entire property. The Court therefore held that these purchasers may enforce these restrictive covenants among themselves for their own benefit.

Private Covenants

RHODE ISLAND.—*Smith v. Zoning Board of Review of City of Pawtucket*, 170 Atl. 75 (Supreme Court, January 10, 1934).—A restriction in a deed of sale of a piece of land that if any buildings other than dwelling houses or garages were built upon the lot while the vendors owned adjoining property the deed should become void and the property revert to the vendors, or their heirs or assigns, did not run with the land, but was personal to the vendors.

EDITOR'S NOTE.—In modern real estate developments it is a common practice to file a plat showing streets of given width, parks and other amenities. It is also common to insert in deeds conditions that no house shall be built upon a lot less than a given ample area, or that no house shall cost less than a given sum. Conditions of this sort evidently affect the value of the land and concern every one in the development, and the use and enjoyment to be obtained from it. These conditions are therefore said to "affect the land" and to "run with the land." As a result, every purchaser of a lot in the development can enforce them against every other purchaser; and this was the intent of the developer of the land, who filed the plat and made the conveyances.

The agreement in this case was of an entirely different character. It was not made for the benefit of the development, but only for that of the vendors. This is what the Court means by saying that it is "personal" and "does not run with the land."

The case of *Murphy v. Hitchcock*, however, is one in which covenants affecting the land were made for the benefit of all the landowners in the tract, and therefore could be enforced by any one of them against any other.

Now Is the Time to Re-zone

A GENERAL revision of the zoning ordinances of American cities "based upon reasonable but no longer fantastic provisions for future more intensive uses," is urged by Graham Aldis in the February number of *Current History*. Writing on "Real Estate and Taxes," Mr. Aldis points out that while such revision may in many cases dash the dreams of the real estate owner, "it will also afford him the sense of security and economic justification for undertaking a modest improvement. A bungalow on the land is worth a two-flat on the blueprint."

"In considering this aspect of the problem," Mr. Aldis continues, "the opinions of the advocates of mass housing are significant. It is notorious that both President Hoover's Reconstruction Finance Corporation and the present Federal Emergency Administration of Public Works have found it hard to discover many such projects which appear suitable to finance. 'The biggest barrier is land cost.' The housing division has announced a limit of $4 per square foot; otherwise the rentals will be too high. Unfortunately, land in the 'blighted districts,' which surround the center of many a large city, is held at a higher figure, mainly because of its zoning classification. The conclusion is obvious.

"Those whose properties are thus to be re-zoned into a lower category will naturally protest, quite probably with the subservient sympathy of their ward politicians. Such a plan is bound to involve discrimination and deprivation of vested, although unexercised, rights. Several expedients, however, are available which, if skilfully applied, will abate any such injustices. First, reclassification of any district back to the former more intensive use might be permitted (with the consent of a majority of the holdings affected), if it could be shown that projects aggregating a given value were actually financed and ready to be carried out. In other words, classification on a basis of genuine instead of fictitious utility. More effectual still would be the intelligent cooperation of the assessor in taking into consideration, as some assessors already do, the use for which a property was zoned. Owners standing out for the right to construct two-flats would have to pay on a higher land value than their neighbors in the next block who remained content with their bungalows. Confronted with such a choice, the owners themselves might even be left to make their own decisions. Since these would have to be on a basis not of individual but of block or district choice, it can be imagined that such a policy would promote both neighborliness and economic understanding, two qualities conspicuously lacking in our great cities."

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This "Caterpillar" Diesel Fifty Tractor, equipped with bulldozer, is cutting the costs of filling in around culverts on a Long Island, New York, road-building job.

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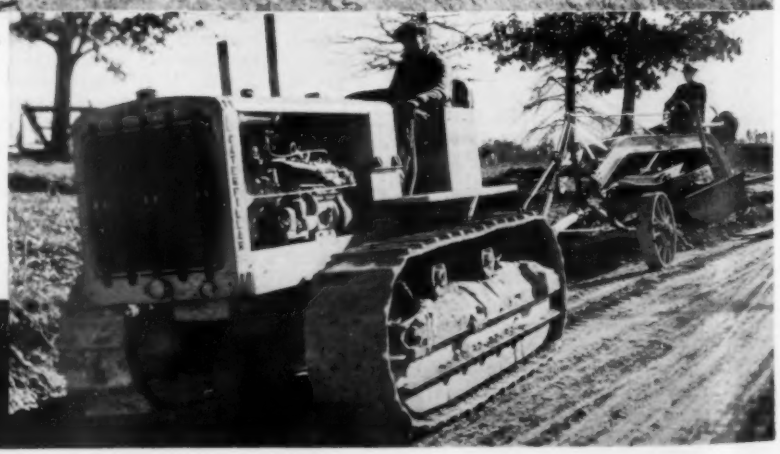

Polk County, Georgia, found how to build and maintain more miles of road for fewer taxpayers' dollars—with a "Caterpillar" Diesel Tractor and "Caterpillar" Grader.

THE CITY'S LEGAL RIGHTS AND DUTIES

Conducted by A. L. H. STREET, Attorney at Law

Accidents

City held liable for negligence of nurse in hospital receiving mostly pay patients (Minnesota Supreme Court: *Borwege v. City of Owatonna*, 251 N. W. 915).

That a sidewalk was in dangerous condition from the afternoon of one January day to the evening of the next, on account of accumulated ice, did not charge defendant city with negligence in failing to discover and remedy the condition before a pedestrian fell and was injured (Pennsylvania Supreme Court: *Beebe v. City of Philadelphia*, 167 Atl. 570).

Annexation

Land may not be annexed to city for revenue purposes only (Nebraska Supreme Court: *Witham v. City of Lincoln*, 250 N. W. 247).

Bond Elections

Bond election held not vitiated by omission in posting notices (Kansas Supreme Court: *Drum v. French*, 25 Pac. 2d, 579).

Civil Service

Police superintendent held not removable for press interview concerning an intimation that he resign, use of profanity, etc. (Michigan Supreme Court: *Carroll v. City Commission of Grand Rapids*, 251 N. W. 381).

Dismissed policeman held required to pursue remedy under civil service law for reinstatement before resorting to courts (Ohio Court of Appeals, Cuyahoga County: *State v. Davis*, 187 N. E. 729).

Contracts

Contract held valid although let to sole bidder (Oklahoma Supreme Court: *McKnight v. City of Oklahoma City*, 25 Pac. 2d, 638).

City's contract to supply water held invalid unless in writing, as required by statute (Alabama Supreme Court: *City of Gadsen v. Jones*, 150 So. 359).

Drains

City held liable for overflow of drain, due to negligence in permitting clogging, despite unprecedented rainfall (Georgia Court of Appeals: *City of Thomson v. McCorkle*, 171 S. E. 186).

Finances

Loss through county treasurer's embezzlement held not subject to apportionment against subordinate taxing districts by order of county board (Kansas Supreme Court: *School District v. Board of County Commissioners*, 25 Pac. 2d, 578).

Municipality held not liable on unauthorized loan obtained from bank by treasurer (Wisconsin Supreme Court: *Richland County Bank v. Joint School District No. 8*, 250 N. W. 407).

Franchises

Intercity bus line held entitled to reasonable time in which to apply for license or franchise from city, whose right to require same had been contested in good faith (Minnesota Supreme Court: *City of St. Paul v. Twin City Motor Bus Co.*, 250 N. W. 572).

Municipal Utilities

City held not empowered to purchase light and power plant to be paid for out of net earnings (Nebraska Supreme Court: *Interstate Power Co. v. City of Ainsworth*, 250 N. W. 649).

City held empowered to contract with company to furnish electric service (Ohio Court of Appeals, Cuyahoga County: *State v. Michell*, 187 N. E. 739).

Official Bonds

City Controller's bond held to cover omission to deduct advancements from payments made to contractor (Washington Supreme Court: *City of Tacoma v. Peterson*, 25 Pac. 2d, 1034).

City Treasurer's bond held to have validly exempted surety from liability for loss due to bank failure (Springfield, Mo., Court of Appeals: *City of Portageville v. Fidelity & Casualty Co. of New York*, 63 S. W. 2d, 411).

Treasurer's bond held broken by depositing funds in bank not designated as depository by Council (Nebraska Supreme Court: *South Sioux City v. Mullins*, 250 N. W. 549).

Ordinances

City may be enjoined against discrimination in enforcing ordinance, but not against enforcing ordinance (Kentucky Court of Appeals: *City of Covington v. Gausepohl*, 62 S. W. 2d, 1040).

Purchases

Puerto Rican municipality held not liable on purchases made by official in excess of appropriation and without director's approval (United States Circuit Court of Appeals, First Circuit: *Municipality of Rio Piedras v. Serra, Garabis & Co.*, 65 Fed. 2d, 691).

Recalling Officials

Interference with municipal manager, usurping authority, arrogance, etc., held grounds for election to recall councilmen (New Jersey Supreme Court: *Leers v. Diehl*, 167 Atl. 216).

Street Assessments

Provision for front-foot assessments for street improvements on petition of majority of abutters, or on order of mayor and aldermen unless protested by majority of abutters, held constitutional (Louisiana Supreme Court: *Boagni v. Mayor and Aldermen of Opelousas*, 149 So. 494).

Street assessment held not vitiated by lack of formal notice to abutter who had actual notice nor by amendment of ordinance to show name of true owner (Texas Court of Civil Appeals: *McAlexander v. Smith Brothers, Inc.*, 62 S. W. 2d, 530).

Court's jurisdiction to vacate streets held not abrogated by establishment of planning commission for charter city (Ohio Court of Appeals, Hamilton County: *City of Cincinnati v. Wess*, 186 N. E. 854).

Lot held not assessable for street improvements where separated from street by strip reserved by city for future widening (Michigan Supreme Court: *Evensen v. City of Detroit*, 249 N. W. 864).

Special Assessments

Validity of municipal incorporation proceedings held not subject to attack in a suit to enjoin collection of special assessments (Illinois Supreme Court: *Fox v. Maxwell*, 187 N. E. 166).

Public property held not subject to special assessment in absence of statute allowing it (Missouri Supreme Court: *State v. School District of Kansas City*, 62 S. W. 2d, 813).

Taxation

Constitutional exemption of public property from taxation held not to exempt city from excise tax on gasoline imported from another state for municipal use (Louisiana Supreme Court: *State v. City of Monroe*, 149 So. 541).

Although paving machinery was used throughout the state on various jobs, it was taxable by the city where the owner had his headquarters (Georgia Supreme Court: *O'Neal v. Whitley*, 170 S. E. 376).

Incorporated educational and recreational center's right to tax exemption held dependent upon whether profits were distributed for private or charitable purposes (Connecticut Supreme Court of Errors: *Stamford Jewish Center v. Town of Stamford*, 166 Atl. 5).

City's liability to school district for uncollected taxes held dependent upon whether delinquent taxpayers had property subject to levy (Michigan Supreme Court: *School District of City of Lansing v. City of Lansing*, 249 N. W. 848).

Water Supply

One city held justified in refusing permit to another to drill and operate a well as a source of water supply (California District Court of Appeal: *City of South Pasadena v. City of San Gabriel*, 25 Pac. 2d, 516).

Workmen's Compensation

Compensation Act held to cover death of Fire Chief from monoxide poisoning while starting car in his garage to carry him to his duties (Nebraska Supreme Court: *Struve v. City of Fremont*, 250 N. W. 663).

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Housing and Slum Clearance

Law and Contemporary Problems, the new quarterly edited by Professor David F. Cavers of the Duke University School of Law, will devote its entire forthcoming issue to a symposium on problems relating to low-cost housing and slum clearance. The primary purpose of the symposium is to present for consideration some of the legal questions which current housing activity is now raising. However, underlying the policy of this periodical is the belief that no legal problem can be properly appraised in isolation from its social, economic, and political context, and, therefore, articles which furnish this essential background have also been obtained.

Introductory articles by Drs. Edith Elmer Wood and Carol Aronovici sketch the history of the housing movement and outline the basic factors in the current housing situation. Earle S. Draper and Tracy B. Augur, of the Tennessee Valley Authority, have collaborated in a paper presenting the regional approach to the housing problem, while Herbert U. Nelson has approached it from the standpoint of the real estate interests. Alfred Bettman depicts the relation of housing to city planning. Harold S. Buttenheim deals with its relation to taxation.

An article by Ernest J. Bohn, President of the National Association of Housing Officials, considers the political problems involved in obtaining housing legislation. Another article will discuss the recent legislation in this field. Coleman Woodbury writes on the land assembly problem as it is accentuated by our archaic condemnation laws. A student note will discuss the mooted question of the Federal Government's power to condemn for housing. Walter H. Blucher will discuss the control of housing administration under current legislation and under Federal contracts with local housing bodies. Charles S. Ascher draws on his experience as counsel for the City Housing Corporation in depicting the relations between the housers and the housed and the legal problems incident to those relations.

This symposium, which will appear early in April, may be obtained for 60 cents from *Law and Contemporary Problems*, Duke University, Durham, N. C.

Slum Clearance

In a 4-page reprint from the February, 1934, issue of *The Architectural Forum*, Clarence S. Stein discusses the principles and data on which it is possible to determine the rentals that occupants of existing slum areas in New York City can afford to pay for decent housing; and at what rentals such housing can be provided and the money invested be paid off over the period of amortization. (Apply to the magazine, 135 E. 42d St., New York.)

Housing

The National Association of Housing Officials (850 E. 58th St., Chicago, Ill.) has issued a manual entitled "Public Housing Surveys," prepared by Edmond H. Hoben, Planner for Board of Public Land Commissioners, Milwaukee, Wis. It is a practical handbook for groups actually undertaking a survey, and suggests the facts which must be obtained, and how to get them, giving sample survey forms and instructions for their use. All the essential principles of the organization and carrying-out of such a survey are covered. 20 pp., photo offset reproduction. Free to officials; 25c to others. (Apply to the Association.)

Housing

A concrete program for slum clearance and housing relief is presented in "New Homes for a New Deal," a reprint of four articles, by Albert Mayer, Henry Wright and Lewis Mumford, appearing in issues of *The New Republic* from February 14 to March 7. Not first the undertaking of slum clearance alone, is advocated in the comprehensive program, but procedure on a threefold basis: construction of low-rental housing on cheap land, slum clearance and rescue of large deteriorating areas that will soon be slums. In the concluding chapter the three authors join in presenting the principles involved in planning for a new kind of building, a new kind of financing, and new kind of community plan to "meet the emergency and build beyond it." 48 pp.; handy size. (25c from THE AMERICAN CITY.)

Asphalt Paving

Report No. 82 (February, 1934) of the American Municipal Association is entitled "Municipal Paving (or Asphalt) Plants." It is based on a questionnaire filled out by a representative group of American cities, and gives brief tabular information on the existing municipal asphalt plants and the kind and amount of work they do. 4 mimeographed pp. 25c. (Apply to the Association, Drexel Ave. and 58th St., Chicago, Ill.)

Highways

"Chiseling the Motorist's Road Dollar," an address by Roy F. Britton, Director, National Highway Users Conference, before the annual convention of the Associated General Contractors of America, Inc., at Washington, D. C. on January 30, 1934, has been reprinted in a handy-size pamphlet. It maintains that motor-vehicle owners' special taxes should be used for highways and for no other purpose. 15 pp. (Apply to the National Highway Users Conference National Press Bldg., Washington, D. C.)

Public Works

The International Association of Public Works Officials has published the Proceedings of its annual convention held in Milwaukee, Wis., September 21-23, 1933, in a 50-page pamphlet. Authorities in various divisions of the field of municipal government and administration presented papers and took part in the discussions here recorded. (Apply to A. M. Anderson, Secretary of the Association, 100 N. La Salle St., Chicago, Ill.)

Accident Prevention

There is valuable material in the smaller volume of the "1933 Transactions of the National Safety Council" reporting portions of the Safety Congress held in Chicago, October 2-6, 1933. This is a condensed record, emphasizing the memorable parts of each paper and address in the three sections of Street and Highway Traffic, Child Education, and Home Safety. Many authorities on these phases of the work of the organization are represented. (Apply to the Council, 20 N. Wacker Drive, Chicago, Ill.)

Taxation

A "Suggested Outline of Recommendations to Facilitate the Collection of Current and Delinquent General Property Taxes" was submitted recently to the Executive Committee of the Chicago Recovery Administration by J. L. Jacobs, of J. L. Jacobs & Co., consultants in public administration and finance, Monadnock Bldg., Chicago, Ill. The two divisions of the outline are: Recommended Changes Through Administrative Action by Public Officials; and Recommended Changes Requiring Legislation. 4 mimeographed pp. (Apply to the company.)

Police

The story of Chicago's police reorganization is told by Bruce Smith, Director of the Police Survey Staff, Institute of Public Administration, in a pamphlet of 45 pages, "Chicago Police Problems: An Approach to Their Solution." Mr. Smith was assisted in the survey by the other members of the research staff—L. S. Timmerman, Earle W. Garrett and Arnold Miles. This is the report of the second part of the work, the first phase having been described in a general report issued in 1931. The survey was followed by extensive reorganization of the Department, the nature, extent and results of which are herein presented. March 10, 1934. (Apply to the Institute, 302 E. 35th St., New York.)

Municipal Power Plants

Public Administration Service (850 E. 58th St., Chicago, Ill.) has issued, as Publication No. 38, a monograph by Edna C. Macmahon, of Columbia University, on "Municipal Electric Plant Managers: Their Selection, Training, Salaries and Tenure," with a list of municipally owned plants in the United States. (See p. 79, this issue.) 41 pp. 19 tables. This study emphasizes the quality of the administration of publicly owned utilities, and presents the facts about the whole group in a way to facilitate comparisons of the local situation with the prevailing practices in communities of similar size, and with average conditions in the same section of the country. One of the enlivening sections of the study deals with the matter of undesirable political interference. 60c. (Apply to the Service.)

Traffic

In *Public Roads* for February, 1934, the journal of highway research issued by the Bureau of Public Roads, U. S. Department of Agriculture, there is a report on "The Effect of Control Methods on Traffic Flow," by E. H. Holmes, Assistant Highway Economist, Division of Highway Transport, of the Bureau. At the intersection studied, Constitution Avenue and Seventeenth Street, Washington, D. C., conditions were ideal for analysis of delay caused by different control methods to a moderately heavy flow of traffic: the flow was steady, both passenger and commercial, a flexible control mechanism was used, and there were no other controlled intersections in the vicinity. The analysis is given in great detail, with photographs, charts and tables. The Appendix explains the methods of survey and analysis. A supplementary article by E. H. Holmes and Lawrence S. Tuttle (also Assistant Highway Economist in the Bureau) explains "An Improved Method of Measuring Speed of Traffic"—a combination of the method described by Mr. Tuttle in the opening article in this issue of *Public Roads*, "A Time Study of Traffic Flow on the New Jersey High-Level Viaduct," and the method used in the Washington study. 21 pp. in all. 10c. (Apply to Superintendent of Documents, Government Printing Office, Washington, D. C.)

Concrete Construction

All-year construction has become of importance in view of the necessity of putting and keeping men at work during the present economic crisis. Where the placing of concrete is involved in a paving job, it is excessively wasteful to keep costly equipment idle and men unemployed during cold weather. A report on "Early Strength Concretes—Effect of Temperature," by H. F. Clemmer, Engineer of Materials, Washington, D. C., presented at the 1934 convention of the American Road Builders' Association, includes instructive information on all-year highway construction. It is the result of laboratory and field investigations carried on in Washington. 16 pp. Diagrams. (Apply to the Association, 938 National Press Bldg., Washington, D. C.)

Other Reports Received

GARDNER, MASS.—Annual Report, Water Department, 1933. 22 pp.

LOWELL, MASS.—Annual Report, Finance Commission, January, 1934. 26 pp.

PALO ALTO, CALIF.—Annual Report, Health Department, 1933. 24 pp.

PHILADELPHIA, PA.—Annual Report, Bureau of Recreation, Department of Public Welfare, 1933. 14 mimeographed pp.

ST. PAUL, MINN.—Annual Report, Civil Service Bureau, 1933. 32 pp.

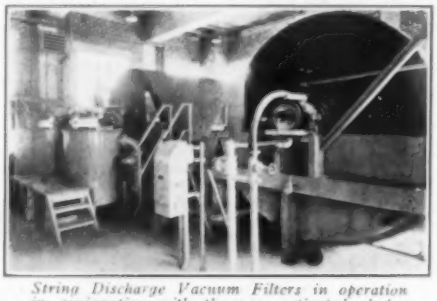
SALT LAKE CITY, UTAH.—Annual Report, Recreation Department, 1933. 22 mimeographed pp.

SHELBURNE, VT.—Financial and Statistical Report, 1933. 44 pp.

WISCONSIN.—An Appraisal of the First Five-Year Program of the State Chamber of Commerce, by E. H. Krueger, February, 1934. 47 pp.

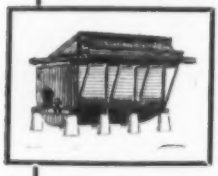
STRING DISCHARGE VACUUM FILTER FOR DEWATERING SLUDGE

WILL HANDLE ALL KINDS OF SLUDGE—FRESH, ACTIVATED, DIGESTED, OR A COMBINATION OF SLUDGES INCLUDING FINE SCREENINGS. OPERATION IS CLEAN, QUICK, ECONOMICAL, ODORLESS. NO MANUAL HANDLING OF SLUDGE REQUIRED.

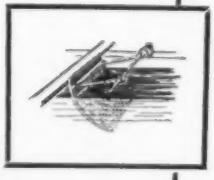


String Discharge Vacuum Filters in operation in conjunction with the new activated sludge plant at Hagerstown, Md. FULLER & McCLINTOCK, Consulting Engineers

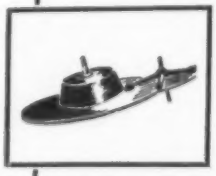
Also Other Mechanical Sewage Equipment



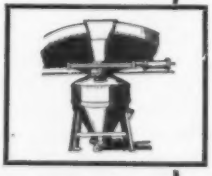
Vacuum Filter used for filtration of raw sewage or final effluent from other processes requiring further refinement. This filter is of the string discharge vacuum type with the greater part of the drum submerged, the object being to obtain the highest degree of clarification of sewage liquors with a high rate of flow.



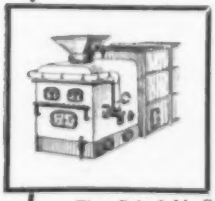
The combination Schofield Bar and Fine Screen here illustrated, contains both the heavy bars for rough screening and intermediate bars spaced as close as 1/16 in. for fine screening, thus offering two screens in one. Automatic, self-cleaning.



For extremely fine screening, the Riensch-Wurl Disc Type is the most efficient and reliable. It may be used as the sole means of treating sewage, or as a preliminary treatment replacing the sedimentation or primary settling tanks.



With this Pneumatic Ejector System, the entire conveying operation takes place within pressure-tight tanks and pipe lines. The motive power is compressed air. Screenings may be conveyed to drying beds located 500 to 1000 feet away, or lifted to any height required.



The Municipal-Decarie Screenings Incinerator—Water-Jacketed Type, employing the Decarie principle of suspending the refuse for predrying, above but in the fire, allows free unrestricted upward burning. This is extremely important, owing to the high moisture content of sewage screenings.

The Schofield Self-Cleaning Automatic Bar Screen here shown, can be installed to handle any amount of flow, and the bars arranged with any size openings. It is entirely automatic, self-cleaning, and has a minimum of working parts. It can be relied upon for uninterrupted service.

Illustrated leaflets available.
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Peerless Pump users include most of the leading industrial concerns and municipalities in this country—institutions which employ their own staffs of consulting engineers—supervise their own tests—are swayed by nothing but cold facts. Their reasons for choosing Peerless Pumps are exactly the same as yours. They demand the utmost in dependable, economical performance with long life and low maintenance cost. They won't be satisfied with less. *Why should you?* Write for the new Peerless catalog and engineering data.

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CONVENTIONS—WHEN AND WHERE

(Figures in parentheses following the name of the convention city indicate the estimated attendance other than local)

April

APRIL 10-12.—AUGUSTA, GA. (250)
American Water Works Association—Southeastern Section. Annual meeting. (Partridge Inn.) Secretary-Treasurer, W. H. Weir, 4 Capitol Square S. W., Atlanta, Ga.

APRIL 11-13.—LAFAYETTE, IND.
American Water Works Association—Indiana Section. Annual meeting. Secretary-Treasurer, C. K. Calvert, 1902 North New Jersey Street, Indianapolis, Ind.

APRIL 16-17.—DAYTONA BEACH, FLA. (120)
American Water Works Association—Florida Section. Annual meeting. Secretary, Louva G. Lenert, State Board of Health, Jacksonville, Fla.

APRIL 18-19.—PEORIA, ILL.
American Water Works Association—Illinois Section. Annual convention. Secretary-Treasurer, A. E. Skinner, Care The Pitometer Co., 5311 Kenmore Avenue, Chicago, Ill.

APRIL 19-20.—BINGHAMTON, N. Y.
American Water Works Association—New York Section. Secretary, R. K. Blanchard, Care Neptune Meter Co., 50 East 42d Street, New York.

APRIL 20-21.—BILLINGS, MONT. (50)
American Water Works Association—Montana Section. Annual meeting. Secretary, Herbert B. Foote, State Board of Health, Helena, Mont.

APRIL 25-27.—LAWRENCE, KANS.
Kansas Water Works Association. Annual meeting. Secretary-Treasurer, E. Boyce, State Board of Health, Lawrence, Kans.

APRIL 30—MAY 1.—WASHINGTON, D. C. (1,000)
National Rivers and Harbors Congress. Secretary, Fred D. Beneke, 708 Earle Building, Washington, D. C.

APRIL 30—MAY 1.—BOSTON, MASS.
New England Safety Conference. Secretary, Lewis E. MacBrayne, 6 Beacon Street, Boston, Mass.

APRIL 30.—GREENWICH, CONN.
New England Sewage Works Association. Spring meeting. Secretary, F. W. Gilcreas, Room 409, 14 Beacon Street, Boston, Mass.

May

MAY 1-4.—WASHINGTON, D. C.
Chamber of Commerce of the United States of America. Annual meeting. Secretary, D. A. Skinner, 1615 H Street N. W., Washington, D. C.

MAY 1.—PHILADELPHIA, PA.
Pennsylvania Housing and Town Planning Association. Annual meeting. Secretary, B. H. Ritter, 1701 Walnut Street, Philadelphia, Pa.

MAY 1-2.—BIRMINGHAM, ALA. (125)
Southern Commercial Secretaries' Association. Annual meeting. Secretary-Treasurer, Charles Ketchum, Greensboro, N. C.

MAY 3-4.—WASHINGTON, D. C.
Maryland-Delaware Water and Sewerage Association. Annual conference. Secretary, A. W. Blohm, 2411 North Charles Street, Baltimore, Md.

MAY 7-9.—DALLAS, TEXAS.
City Marshals and Chiefs of Police Union of Texas. Annual convention. Secretary, George A. Smith, P. O. Box 299, Dallas, Texas.

MAY 9-10.—GADSDEN, ALA. (100)
Alabama League of Municipalities. Annual convention. Secretary-Treasurer, M. L. Robertson, Cullman, Ala.

MAY 10-12.—EUGENE, ORE.
American Water Works Association—Pacific Northwest Section. Annual meeting. Secretary, Ernest C. Willard, 720 Corbett Building, Portland, Ore.

MAY 14-16.—MACON, GA. (650)
Association of County Commissioners of Georgia. Annual convention. Acting Secretary-Treasurer, Tate Wright, Athens, Ga.

MAY 14-17.—ATLANTIC CITY, N. J. (500)
National Fire Protection Association. Annual meeting. (Hotels: Haddon Hall and Chalfonte.) Managing Director, Franklin H. Wentworth, 60 Batterymarch Street, Boston, Mass.

MAY 18-19.—KANSAS CITY, MO. (300)
National Probation Association. Annual convention. Executive Director, Charles L. Chute, 450 Seventh Avenue, New York.

MAY 19-20.—EXCELSIOR SPRINGS, MO.
Association of Community Chests and Councils. Annual meeting. Executive Director, Allen T. Burns, 1815 Graybar Building, New York.

MAY 21-26.—KANSAS CITY, MO. (3,000)
National Conference of Social Work and Affiliated Associations. Annual conference. General Secretary, Howard R. Knight, 82 North High Street, Columbus, Ohio.

MAY 24.—NEW YORK.
National Board of Fire Underwriters. Annual meeting. General Manager, W. E. Mallalieu, 85 John Street, New York.

MAY 30—JUNE 1.—CHICAGO, ILL.
American Association of Museums. Annual meeting. Director, Laurence Vail Coleman, Smithsonian Institute, Washington, D. C.

June

JUNE 4-8.—NEW YORK. (1,200)
American Water Works Association. Annual convention. (Hotel Commodore.) Secretary, Beekman C. Little, 29 West 39th Street, New York.

JUNE 5-6.—WASHINGTON, D. C. (70)
Conference of State and Provincial Health Authorities of North America. Secretary, Dr. A. J. Chesley, State Board of Health, St. Paul, Minn.

JUNE 9-10.—GREENWICH, CONN.
New England Association of Commercial Executives. Annual meeting. Secretary, Lewis W. Neweld, Salem, Mass.

JUNE 11-13.—MONTREAL, QUE. (300)
Canadian Public Health Association. Annual meeting. General Secretary, Dr. J. T. Phair, Spadina House, Toronto, Ont.

JUNE 13-14.—WAUKEGAN, ILL. (100)
Illinois Association of Sanitary Districts. Annual meeting. Secretary-Treasurer, G. H. Radebaugh, Urbana & Champaign Sanitary District, Urbana, Ill.

JUNE 14-15.—GREEN BAY, WIS.
League of Wisconsin Municipalities. Annual convention. Secretary, Frederick MacMillin, 114 North Carroll Street, Madison, Wis.

JUNE 18-21.—CLEVELAND, OHIO. (900)
National Association of Purchasing Agents. Annual convention and Informashow. Secretary-Treasurer, G. A. Renard, 11 Park Place, New York.

JUNE 24-30.—MINNEAPOLIS, MINN.
National Association of Real Estate Boards. Annual convention. Executive Secretary, Herbert U. Nelson, 59 East Van Buren Street, Chicago, Ill.

JUNE 25-29.—HOT SPRINGS, VA.
American Institute of Electrical Engineers. Annual summer convention. Assistant National Secretary, H. H. Henline, 33 West 39th Street, New York.

JUNE 25.—SALT LAKE CITY, UTAH.
American Legislators' Association. Western Bus and Truck Conference. Executive Director, Henry W. Toll, Drexel Avenue and 58th Street, Chicago, Ill.

JUNE 25-27.—STATE COLLEGE, PA.
Pennsylvania Water Works Operators' Association. Annual convention. Secretary-Treasurer, I. M. Glace, 506 South Office Building, State Capitol, Harrisburg, Pa.

JUNE 26-28.—BURLINGTON, VT. (200)
New England Association of Fire Chiefs. Annual convention. Secretary-Treasurer, John W. O'Hearn, 99 Main Street, Watertown, Mass.

JUNE 28-29.—EDMONTON, ALTA. (100)
Union of Alberta Municipalities. Annual convention. Secretary-Treasurer, J. E. Frazer, Wetaskiwin, Alta.

July and August

JULY 11-14.—VANCOUVER, B. C.
American Society of Civil Engineers. Annual convention. Secretary, George T. Seabury, 33 West 39th Street, New York.

JULY 12-14.—MARTINSVILLE, VA.
American Water Works Association—Virginia Section. Secretary, H. W. Snidow, 601 State Office Building, Richmond, Va.

JULY 25-27.—MICHIGAN CITY, IND. (250)
Indiana Association of Chiefs of Police. Annual meeting. Secretary-Treasurer, A. G. Eversole, Lafayette, Ind.

AUGUST, SECOND WEEK IN.—RICHFIELD, UTAH. (300)
Utah State Municipal League. Annual convention. Secretary-Treasurer, P. K. Nielsen, Price, Utah.

AUGUST 23-24.—WHEELING, W. VA.
American Water Works Association—Central States Section. Annual convention. Secretary, H. L. Nelson, 2435 Koppers Building, Pittsburgh, Pa.

AUGUST 27, WEEK OF (TENTATIVE).—MILWAUKEE, WIS.
International Association of Fire Chiefs. Annual convention. Secretary, James J. Mulcahey, Yonkers, N. Y.

AUGUST 29—SEPTEMBER 1.—WASHINGTON, D. C.
International Association of Municipal Electricians. Annual convention. (Wardman Park Hotel.) Secretary, W. H. Harth, Columbia, S. C.

AUGUST 30-31.—PITTSBURGH, PA. (200)
National Shade Tree Conference. Annual convention. Secretary-Treasurer, Dr. R. P. White, New Jersey Agricultural Experiment Station, New Brunswick, N. J.

September and October

SEPTEMBER 3-6.—PASADENA, CALIF.
American Public Health Association. Annual meeting. Acting Executive Secretary, Dr. Kendall Emerson, 450 Seventh Avenue, New York.

SEPTEMBER 16-21.—LOUISVILLE, KY. (300)
American Institute of Park Executives and the American Park Society. Annual convention. Executive Secretary, William H. Walker, 2234 Inglewood Place, South Bend, Ind.

SEPTEMBER 17-19.—SANTE FE, N. MEX.
American Water Works Association—Rocky Mountain Section. Annual meeting. Secretary-Treasurer, B. V. Howe, 437 State Office Building, Denver, Colo.

SEPTEMBER 17-19.—PHILADELPHIA, PA.
Municipal Finance Officers' Association of the United States and Canada. Annual convention. Executive Director, Carl H. Chatters, 850 East 58th Street, Chicago, Ill.

SEPTEMBER 24-28.—CLEVELAND, OHIO.
American Transit Association. Annual convention. General Secretary, Guy C. Hecker, 292 Madison Avenue, New York.

SEPTEMBER 24-27.—WASHINGTON, D. C. (700)
International Association of Chiefs of Police. Annual convention. Secretary, George Black, Chief of Police, Wilmington, Del.

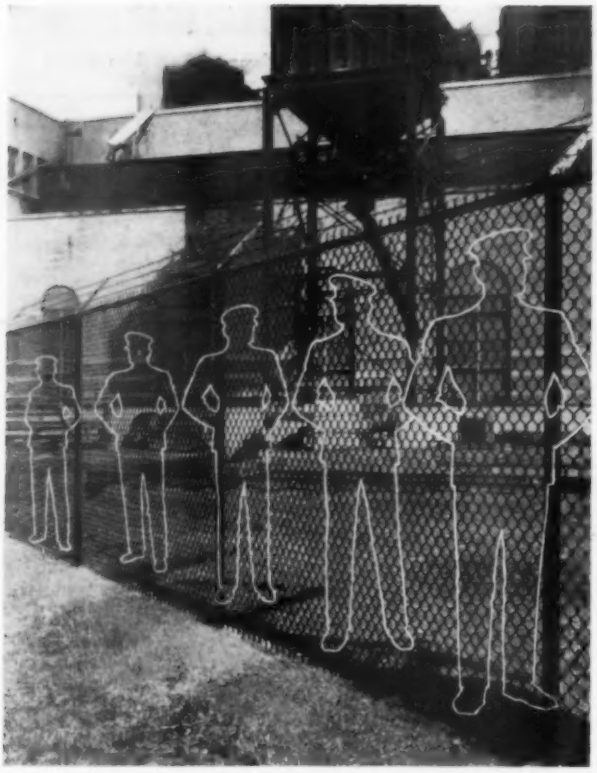
SEPTEMBER 26-28.—ROCHESTER, N. Y. (150)
International Association of Public Works Officials. Annual convention. (Sagamore Hotel.) Secretary, A. M. Anderson, 100 North LaSalle Street, Chicago, Ill.

OCTOBER 1-5.—CLEVELAND, OHIO.
National Safety Council. Annual congress. Managing Director, W. H. Cameron, 20 North Wacker Drive, Chicago, Ill.

OCTOBER 15-17.—ST. LOUIS, MO. (300)
International City Managers' Association. Annual convention. Executive Director, Clarence E. Ridley, 850 East 58th Street, Chicago, Ill.

OCTOBER 15-18.—WACO, TEXAS. (350)
Southwest Water Works Association. Annual convention. (Hotel Hilton.) Secretary-Treasurer, Lewis A. Quigley, Fort Worth, Texas.

NOVEMBER 8-10.—OMAHA, NEBR.
American Water Works Association—Missouri Valley Section. Annual meeting. Secretary, Earl L. Waterman, University of Iowa, Iowa City, Iowa.



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Sizes 500 to 1200 gallon

For Hot or Cold Application

CHIP SPREADERS — SAND SPREADERS
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GOOD ROADS MACHINERY CORP.
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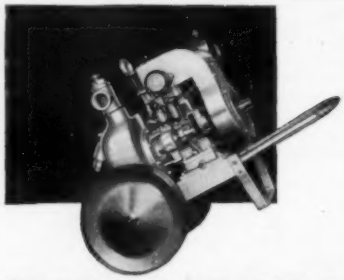

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NEWS AND ILLUSTRATIONS

Items of Interest to City, Town and County Officials, and Others Concerned with the Economical Construction and Efficient Operation of Public Improvement Undertakings

Device Converts Power Grader to Road Mix Machine

An attachment built for use with any auto patrol blade having a minimum of 30 horsepower has been developed by the Northwest Bituminous Corporation, 328 Liberty Building, Des Moines, Iowa. This Rotomix attachment is a standard 10-foot drum cast in one piece, with swinging gates which are self-adjusting up and down to take up wear on the cutting edge, and which can be adjusted to a maximum of 18 inches to feed material, or closed when laying down mixed material. A motor to operate the mixing blades within the cylinder is mounted above the frame, and the mixing chamber or cylinder is suspended below with all of the blade manipulation retained.

The standard mixing chamber is 26 inches in diameter and 10 feet long, equipped with a centrally driven transverse rotating shaft of 2¼-inch square steel, with the steel mixing teeth bolted to the shaft in pairs set alternately at 45 degrees and 135 degrees with the rotating axis. The mixing shaft is driven from a 6-cylinder Waukesha motor by a telescoping drive shaft of square steel tubing with Universal joints at each end, transmitting the power vertically from a fully enclosed bevel geared reduction unit mounted on the motor to a lower fully enclosed bevel g e a r e d drive mounted on the mixer blade shaft.

The exhaust heat from the Rotomix motor and patrol motor is conducted through 3-inch fixed and telescoping flexible tubing to a central point back of the mixing chamber. The heat is forced into a shallow chamber 10 inches wide by 8 feet long on the inside of the Rotomix drum.

This is claimed to be the only combination oil-mix machine which can windrow the material, reduce the moisture content by aeration, thoroughly dry-mix the various material gradings, and quickly coat the materials by stirring with fast revolving paddles instead of depending on rolling in front of the blade.

A New Surface Heater for Street Repairing

Over the past few years, resurfacing and patching of streets by the surface heater method has greatly increased. Large and small cities and towns have followed the lead of Washington, D. C., New York City, Cincinnati and Philadelphia in the use of surface heating equipment. In keeping with this trend, Littleford Bros., Cincinnati, Ohio, have added a new surface heater to their line of road maintenance equipment; it is known as the No. 98-LP low-pressure surface heater. It is a maintenance unit that plays an important part in surface repairing of sheet asphalt streets.

This outfit differs from the standard Littleford surface heater in that it is heated by low-pressure burners instead of coil-type burners. The low-pressure burner requires no preheating—it lights instantly; it consumes domestic fuel oil and efficiently produces a great amount of heat.

FOUR LITTLEFORD LOW-PRESSURE SURFACE HEATERS WORKING IN FRONT OF THE WHITE HOUSE, WASHINGTON, D. C.

New Washington Offices of U. S. Pipe and Foundry Co.

The United States Pipe and Foundry Co., Burlington, N. J., has recently opened offices in Room 608, Earle Building, Washington, D. C., in charge of S. E. Linderman, Washington representative. Effective April 1, this company will also open offices in the Consolidated Gas Building, Boston, Mass., in charge of Carl N. Brown, formerly Kansas City Sales Agent. Mr. Brown will be succeeded at the Kansas City office by R. C. Lemert, formerly of the Birmingham, Ala., Sales Office.

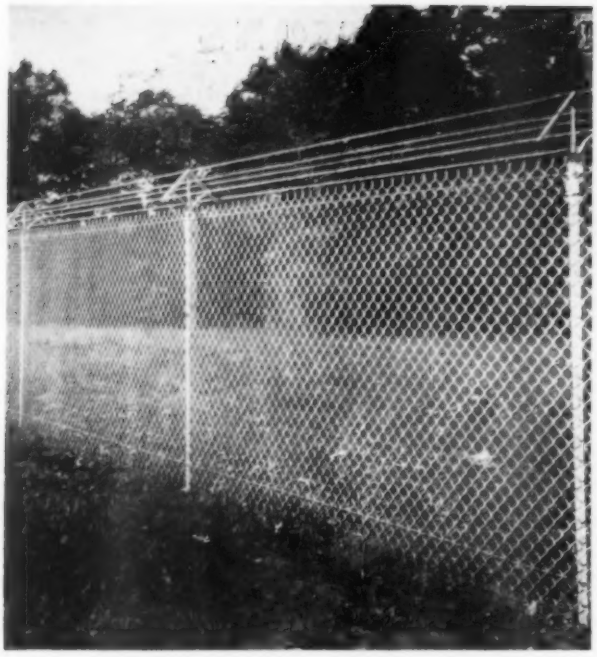
Pittsburgh Equitable Announces New District

The Pittsburgh Equitable Meter Co., of Pittsburgh, Pa., has announced the establishment of a new district to serve the territory of central and western New York State. C. F. Thomas, who has been acting as New York State representative for a number of years, will be District Manager in charge of the new territory, assisted by D. A. Gardner, who has also represented the company in the past in various sections of the country. An office will be opened at some point in this territory in the near future, the exact location to be announced as soon as negotiations have been completed.

Hypo-Chlorination of Water

While H T H, made by The Mathieson Alkali Works, Inc., 250 Park Avenue, New York, is "a source of hypochlorite solution," this statement seems to minimize to some extent one of the important features of H T H in water treatment, namely, that it is so readily soluble that the dry powder can be added direct to the water to be treated. This property of the product is particularly valuable in such uses as sterilizing new water mains and the chlorination of reservoirs, standpipes and tanks, and also in the treatment of swimming pool water. Many people use H T H for preparing stock solutions which are then used for treating purposes, but one of its distinguishing features is that it can be added direct to water in many applications where the use of solutions would be inconvenient or impracticable for the operator.

THE NEW COMPACT McCORMICK-DEERING 21-HORSEPOWER MODEL I-12 TRACTOR, ADAPTED TO MANY MUNICIPAL SERVICES WHERE SPEED AND ABILITY TO MANEUVER IN CLOSE QUARTERS ARE REQUIRED



5 NEW FEATURES ADD *Extra Years* OF FENCE LIFE

Continental fence invites inspection on a *visible value* basis. It is made to win the approval of experienced engineers, who take nothing for granted. Among the new construction features that add extra years of fence life are these: Heavier and stronger H-section line posts; wire of higher tensile strength; new exclusive top rail coupling 7" long fits inside as well as outside; new tension locking pin eliminates all bolts and nuts; improved pivot type hinges insure perfect gate operation without any maintenance.

See Continental fence before you buy and write now for new catalog.

CONTINENTAL STEEL CORPORATION

Dept. C, Kokomo, Indiana

Manufacturers of Billets, Rods, Wire, Barbed Wire, Nails; Lawn, Chain-Link, Farm and Poultry Fence; Gates; Black Galvanized, Galvannealed, and Special Coated Sheets; Galvanized Roofing (also "Seal of Quality" Roofing) and Kindred Products.

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Chain Link **FENCE**

OFFERS LOWER COST PER YEAR OF SERVICE

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Above: Coldwell "L-Twin" motor lawn mower and roller. Mows and rolls simultaneously 4 to 6 acres a day. With gang units attached it cuts a 60-inch swath, ten acres a day.

Dependable Performance

UNDER all conditions in developing and maintaining fine lawns, the Coldwell Line of Dependable Power Lawn Mowers and Rollers has stood the test for a generation.

Coldwell engineers have developed in the late models many notable features. Twin cylinder engines develop an abundance of smooth, even power without vibration or excessive noise. Roller bearings and automatic lubrication insure long trouble-free performance—simple and economical to operate—reasonable in price.

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NEWBURGH, N. Y., U. S. A.
In Canada—Taylor-Forbes Co., Ltd., Guelph
Manufacturers of ***DEPENDABLE*** *Lawn Mowers*—HAND, HORSE, GASOLINE, ELECTRIC

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TREE SURGERY SUPPLIES
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A. M. LEONARD & SON
PIQUA, OHIO

WEED AS YOU WALK

with a Dolge Sprinkler filled with a solution of Dolge Weed Killer. The new super-strength formula gives you a quick long-lasting kill, ridding walks, paths, baseball fields, playgrounds of weeds for a whole season. Effective on poison ivy, crab grass, thistle, and other rank, deep-rooted growth. Saves time, labor, money. Write for prices, and liberal terms on sprinkling cart.

THE C. B. DOLGE COMPANY, WESTPORT, CONNECTICUT
Manufacturers of sanitation and ground maintenance products.

An Easily Repaired Highway Guard

A new guard-rail made of material selected on the basis of strength and long life, which may be easily erected and is economical in installation, which has automatic adjustments which maintain the proper tension at all times and in which damaged sections can be easily repaired or replaced in any part of the rail, has been developed by the Toncan Culvert Manufacturers Association, Youngstown, Ohio. Tyton highway guard is mounted on posts of the conventional type of wood, concrete or metal. The posts are lined up in the usual way and then drilled to take the spring bolts. The heavy leaf springs of carbon steel are then mounted on the posts to support the panels. After all the springs are loosely bolted to the posts, the erection of the panels is easy. The end of one panel telescopes over the end of the next panel. Twelve heavy carriage bolts at each panel connection provide ample strength. The bolts passing through the spring are left loose until after the rail is in proper tension.

The front of the panel provides a smooth surface to guide the vehicle. The post at each end is anchored by the installation of a dead-man. The operation of tightening up the end springs brings the Tyton installation into proper tension when the tightening of the bolts passing through the springs at each panel connection completes the installation.

Famous Lighting Expert Dies

Walter D'Arcy Ryan, famous General Electric Illuminating Engineer, who made both a science and an art of artificial illumination, died on March 14, 1934, at his home in Schenectady, N. Y. Spectacular lighting, brilliant street lighting laid out on a city-wide scale and based upon scientific studies of the requirements, the birth of floodlighting, the establishment of the profession of illuminating engineering, were all linked with Mr. Ryan's name. Two of the biggest expositions of modern time, the Panama-Pacific International Exposition at San Francisco in 1915 and the Century of Progress Exposition in Chicago in 1933, were illuminated splendidly by his genius.

Born in Kentville, Nova Scotia, in 1870, Mr. Ryan was educated in his home city and in Halifax. At the age of 22 he obtained employment in the old Lynn works of the Thomson-Houston Electric Co. as a student engineer. In 1896 he was promoted to the position of superintendent of test men at the West Lynn works of the General Electric Co. Shortly after this he was made a commercial engineer and served as secretary of the Lynn factory committee. Four years later, in 1903, he was formally designated Illuminating Engineer, the first man to hold such a title in the United States, so far as is known. Since June 13, 1932, Mr. Ryan had been a consulting engineer of the General Electric Co., and his work was that of a consultant for the Illuminating Engineering Laboratory.

AN END-POST ASSEMBLY OF THE TYTON HIGHWAY GUARD

Orchard Says 54th Annual A.W.W.A. Convention Will Be Notable in Every Respect

In an interview, William J. Orchard, President, American Water Works Manufacturers' Association, and Chairman of the Committee on Convention Publicity, said: "The coming 54th Annual Convention of the American Water Works Association is to be one of the most instructive, interesting and entertaining conventions yet held.

"Because this year the meeting will be in New York City, it will be possible to have present a number of very prominent men—consulting engineers, chemists, operators, management and finance authorities—whose work might otherwise prevent them from attending the convention were it held at some other point. The keenest cooperation of these men has been enlisted for this forthcoming convention. Their wealth of experience will be translated into terms of better water-works practice that every operator can apply to his own particular job. Unofficial contact with them as they are present at the convention will give every operator an opportunity to question these authorities on problems that have been bothering them, and the operators, in turn, will have an opportunity to contribute their experiences for the benefit of all.

"Not only is the technical program of the convention to be one of the most instructive ever presented, but here in New York those attending the convention will have an opportunity to join in entertainment features not to be found anywhere else in the world.

"In addition, reports will be made of the activities of the National Recovery Committee for Water Works Construction and the part that they have played to date in obtaining allocation of Federal funds in excess of $200,000,000 for the construction of water works and sewage projects and filing of applications for an additional $660,000,000 for further work."

Asphalt Institute Triples Members in Last Three Years

The Asphalt Institute, 801 Second Avenue, New York, has re-elected as its President B. L. Boye, of the Standard Oil Co. of New York.

Mr. Boye states: "During depression years, our group has tripled its membership without depending on the Code, mainly because of convincing producers that a greater service to the public would be a proportionate service to themselves. Part of this work of increasing the market for asphalt has included intensive research and cooperation with Army engineers in asphalt mat revetment work on the Mississippi River at New Orleans; another phase has been the development of primers and binders adapted to each section of the country; and still another branch of activity has produced progress in bringing order out of the chaos of conflicting tests and specifications in various state highway departments.

"During the coming fiscal year the Institute plans even more research directed towards the improvement of low-cost road types; in this connection it should be noted that on the PWA highway program there were approved up to March 1, 4,249 miles of low-cost bituminous types. Because it has been proved that roads, especially low-cost roads, translate money into jobs quicker than other kinds of public works, the Institute takes special pride in its research and promotional work along this line."

Members joining The Asphalt Institute within the last year are: Ashland Refining Co., of Ashland, Ky.; Lincoln Oil Refining Co., of Robinson, Ill.; Lion Oil and Refining Co., of Eldorado, Ark.; Macmillan Petroleum Corp., of Eldorado, Ark.; Phillips Petroleum Corp., of Bartlesville, Okla.; Pioneer Asphalt Co., of New York City; Sinclair Refining Co., of Louisiana; Skelly Oil Co., of Kansas City, Mo.; and White Eagle Oil Co., of Kansas City, Mo.

Other officers besides Mr. Boye who were re-elected at the Institute's annual meeting were: Vice-Presidents, A. M. Maxwell, Standard Oil Co. of Ohio; Leroy M. Law, Shell Petroleum Corp.; J. A. Blood, Standard Oil Co. of California. T. M. Martin, Lion Oil Refining Co. of Arkansas, was also elected a Vice-President. W. W. McFarland, President of the Warner-Quinlan Co., was re-elected Treasurer. J. E. Pennybacker continues as Managing Director.

Neptune Meter Co. Moves Offices

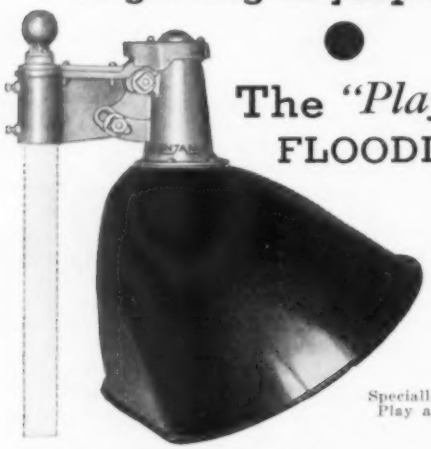
After May 1, the executive and general sales offices of the Neptune Meter Co. and Thomson Meter Corp. will be located at 50 West 50th Street, Rockefeller Center, New York. They are now located at 40 East 42nd Street, New York.

FLOODLIGHT

Playgrounds
Baseball Fields
Football Fields
Tennis Courts
Horseshoe Pitching Courts
Swimming Pools

with

BENJAMIN TRADE MARK
Lighting Equipment



The *"Play-Area"* FLOODLIGHT

Specially designed for Play and Sport Areas

Benjamin floodlights and other lighting fixtures are weather-proof, rugged and durable. They meet the specific needs of sport and play area lighting. Write us fully regarding your lighting needs. We shall be glad to give you helpful suggestions in laying out your lighting and in selecting equipment best suited to your needs and limitations.

Benjamin Electric Mfg. Co.

Des Plaines, Illinois

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Enclosed Floodlight Projector

"Type 79" RLM Dome Reflector

Tennis Court Fixture

All Types, for Streets, Highways

SAFETY FLASHER

Neon Illuminated Signs Operate for 1 CENT a DAY

No cables or wires to string. Safety Flasher Motor and Willard "Low Discharge" Battery contained in sign base underground, operate for 6 for 15 month periods without water or recharging.

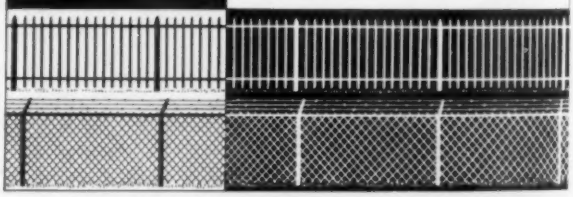
Looks like standard painted sign by day. Flashing letters become visible at 1 mile, readable at 500 ft. at night—24 hrs. a day control for modern traffic.

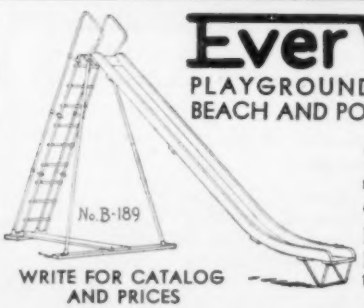
Write for catalog and prices.

THE LAKEWOOD ENGINEERING CO.
505 DUBLIN AVENUE, COLUMBUS, OHIO

FENCE for every PUBLIC PROPERTY need

Stewart FENCES
IRON AND CHAINLINK WIRE
New Catalog sent upon request.
The Stewart Iron Works Company, Inc.
211 Stewart Block Cincinnati, Ohio





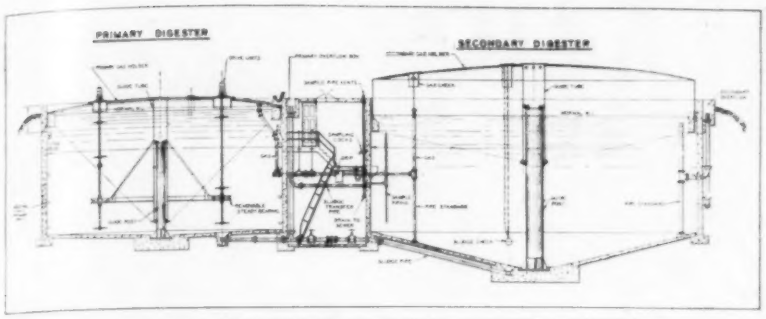
EverWear

PLAYGROUND APPARATUS
BEACH AND POOL EQUIPMENT

The standard of safety, the world over. A complete line of approved apparatus.

WRITE FOR CATALOG AND PRICES

The EverWear Manufacturing Co.
SPRINGFIELD, OHIO



THE DORR MULTIPLE-STAGE SLUDGE DIGESTION SYSTEM

A Multiple-Stage Sludge Digestion System

The most recent development in sludge digestion is the multiple stage sludge digestion system of the Dorr Co., Inc., 247 Park Avenue, New York, combining in one system the advantages of rapid mixing, digestion and gasification. The system produces a clear and harmless supernatant liquor with adequate provision for sludge and gas storage. This is known as the Dorr Multdigestion System. Between 80 and 90 per cent of the sludge digestion takes place in a relatively small, heated, primary digester, equipped with a gas holder. Two or more totally enclosed motors, mounted on the gas holder, drive high-speed Turbo mixers that serve to keep the sludge homogeneous and in rapid circulation. The sludge and gas are automatically transferred from the primary digester to the secondary or storage tank, which is neither heated nor agitated, but is surmounted by a gas holder of any desired capacity.

A clear and harmless supernatant liquor is overflowed only from the second tank. This tank, being in a quiescent state, acts as a clarifier and sludge thickener. Thus the problem of disposing of a foul overflow is done away with and a heavier final sludge is secured.

The extent of digestion in the primary tank practically halves the amount of solids going into the secondary tank. The total detention provided is the same as for single-stage digestion, but the installed cost is less, and, furthermore, scum formation is prevented.

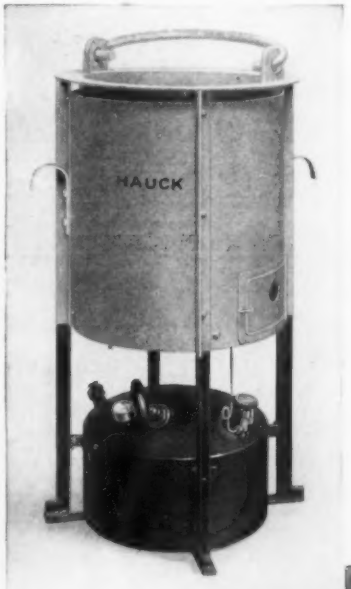
The Dorr Multdigestion System is compact and attractive in appearance, doing away with cumbersome superstructures, separate gasometers and other unsightly auxiliaries, and leaving only the tops of the gas holders and the weather-proof motors exposed to the eye.

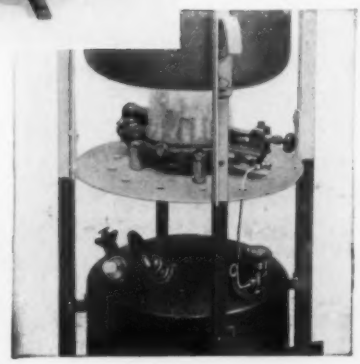
Pratt of Chapman Valve Dies

Charles E. Pratt, of the Chapman Valve Manufacturing Co., Indian Orchard, Mass., died on March 18, 1934, after a short illness. Mr. Pratt was in his 75th year, and for many years had been associated with the Chapman Valve Manufacturing Co. as the Manager of the Anderson Coupling Division, and had general supervision over the distribution of the water-works valves and ground key work in the New England district. He was very well known by engineers and executives of the water companies.

Melting Furnace for Heating Pipe Jointing Compound

A melting furnace which can be used satisfactorily in heating compounds used by water works and sewer departments has recently been announced by the Hauck Manufacturing Co., 126-134 Tenth Street, Brooklyn, N. Y. Instant control of heat in melting pipe jointing compounds is important, since the temperature must be just right to keep the compound suitable for pouring a good joint. The improved burner of the Hauck furnace is designed to give the widest possible range of heat control instantly from a minimum, barely visible flame to any desired maximum. Localized heating, typical of blow-torch type burners, is entirely eliminated. The furnace has one valve heat control which makes it possible for inexperienced men to easily control the temperature of the compound. The burner can be lighted instantly, takes only one minute to obtain maximum heating capacity, and is noiseless in operation. The steel pot avoids overheating and does not use up as much heat as the usual cast iron pot.





GENERAL AND DETAILED VIEWS OF THE NEW HAUCK FURNACE

This No. 37 Hauck compound melting furnace, which is 32 inches in height, burns gasoline. The welded steel tank holds 4 gallons of gasoline, is protected from reflected heat by a shield which permits air circulation to keep the tank cool, and has a powerful, quick-acting hand pump which supplies pressure to force fuel to the burner. The single burner, regulated in operation by one valve, supplies an even, clean flame at all times. The melting pot, which is 14 inches in diameter and 12 inches in depth, is of pressed steel. The whole unit weighs 140 pounds.

New Chart Solves Pump Problems

As a result of hundreds of tests and many months of study conducted in the laboratories of the John Bean Manufacturing Co., Peerless Pump Division, an entirely new chart has been developed by J. M. Hait, Chief Engineer. Heretofore it has been impossible to ascertain horsepower requirements for delivering water against specified heads without a considerable amount of calculation, and because of the number of figures involved most of the work has been done with slide rules.

With the aid of the new chart, the head, capacity, efficiency, or horsepower of deep-well turbine pumps can be computed with any three of these conditions known. For example, if the head, capacity and efficiency are known, the horsepower can be quickly determined by means of the chart.

The new chart is copyrighted, but is included in the new catalog of Peerless Pumps which may be secured from the Peerless Pump Division, Food Machinery Corporation, 300 Walnut Avenue, Massillon, Ohio, or 1900 East 67th St., Los Angeles, by readers of THE AMERICAN CITY. The new catalog also contains 10 pages of engineering data, making it a practical reference book.

A Road Roller with New Power Steering Control

The Hercules Model 100 1-ton, 3-wheel road roller is now available with hydraulic power steering control, especially developed and adapted to roller use, according to an announcement of the Hercules Co., Marion, Ohio. A cast steel steering arm is mounted directly on the squared top of the king post, connected to which is the hydraulic piston and cylinder. The latter is firmly anchored to the ruler frame and mounted on a cast steel saddle. The steering control is located in the operator's cab.

GUARDIANS *of the Public Safety*

During 18 months of the World War 50,510 members of the A. E. F. were killed or fatally injured. During 18 months ending Dec. 31, 1931, 53,650 people lost their lives in traffic accidents in the United States . . . Good street lighting reduces *accidents* . . . speeds up traffic . . . makes good police work easier. It pays . . . in terms of public safety. Graybar's experienced lighting specialists can help you with technical problems . . . show you how to make savings. Write us for information.

Everywhere traffic problems grow daily more complex. Selection of traffic signals requires careful thought and wise planning . . . Automatic control requires adequate control flexibility. Graybar can show you the latest developments in the new science of traffic control. Graybar brings to you, too, a complete selection of all types of traffic signals, mountings, and controls. Also anything and everything else electrical you may need. Ask our salesman about it.

The long arm of the law strikes quickly when it's equipped with Police Radio. Officers in radio-equipped patrol cars often reach the scene of crime in time to catch the criminals on the spot. Effectiveness of police work is enormously increased . . . Western Electric Police Radio equipment —distributed by Graybar—is dependable equipment, worthy of your department. It is in use in more than 30 U. S. cities. Write us for more complete details.

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Mention THE AMERICAN CITY—it helps.

Outdoor Lighting

A Section of *The American City*
Devoted to the Lighting of Streets, Highways, Bridges, Airports, Athletic Fields and Parks, and the Floodlighting of Public Buildings

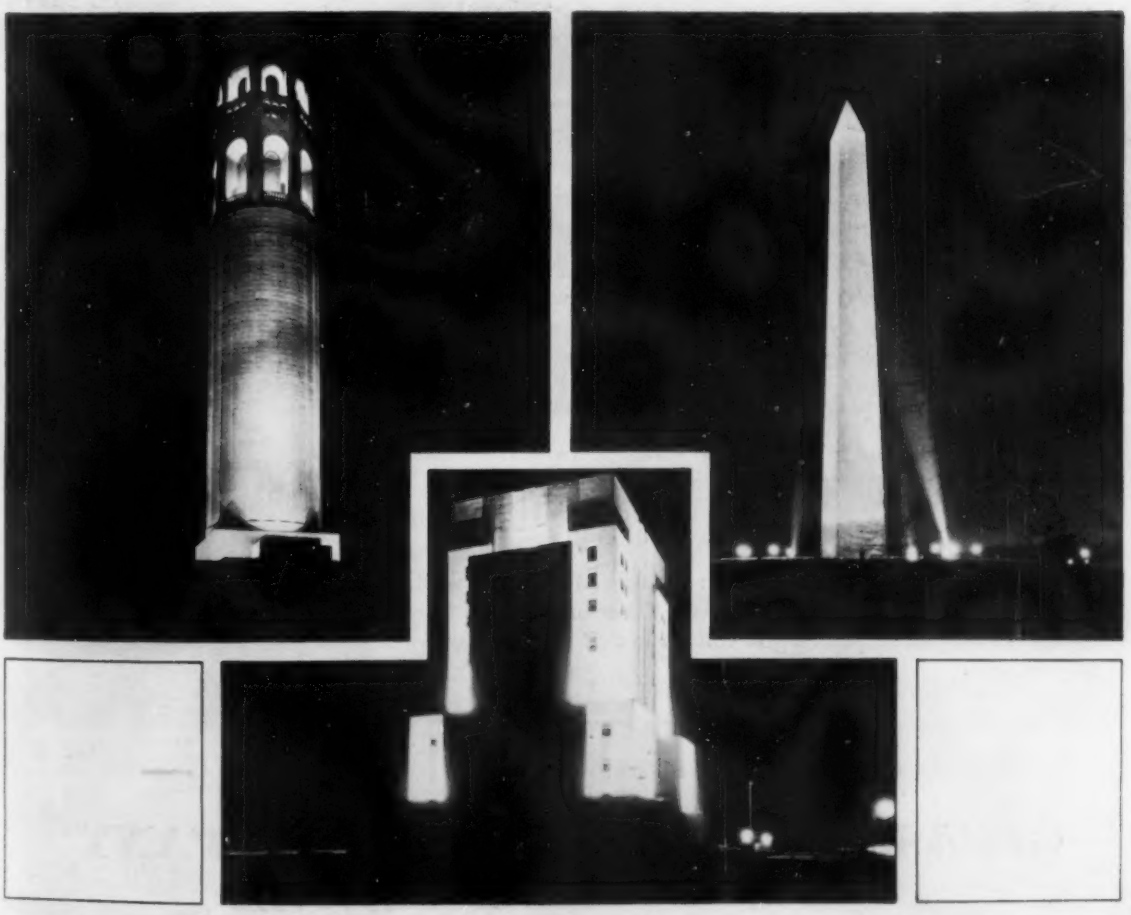
Floodlighting of Public Buildings and Monuments

BOTH beauty and safety are served by the art of floodlighting, in the case of fine buildings and tall monuments.

At the left below is the majestic cylinder of San Francisco's new monument, the Coit Memorial Tower, 175 feet high, erected at the top of Telegraph Hill by the Park Commission through a bequest of Mrs. Lillie Hitchcock Coit. A total of 31,200 watts of floodlighting is used. At the base of the column, twenty 1,000-watt General Electric floodlights paint the ascending shaft with gradually diminishing illumination. At the level of the first tier of arches above the ground, eight 1,000-watt units with stippled lenses throw the vaulted outlines into sharp relief, and the same function is performed at the upper arch level by sixteen 200-watt projectors. At the lantern level atop the tower, eight 1,000-watt units with clear lenses direct their beams vertically into the night. Above the top of the column, a natural-gas torch sends up a 15-foot flame.

The lighting of the Washington Monument is effected by four banks of five Westinghouse projectors illuminating the faces of the shaft, complemented by two searchlights, distantly located, floodlighting the top.

The center photograph shows a side view of an attractive use of G-E floodlights for illumination of the County Court House in Racine, Wis.



Attention to DETAIL

Workmen grinding the edges of Gleason-Tiebout glassware

General Electric Form 32 Novalux lighting unit with Gleason-Tiebout No. 162 rippled globe

General Electric Form 12 Novalux lighting un't with Gleason-Tiebout No. 1124 globe and Typ M casing

EXCELLENCE of street-lighting glassware does not depend on any one factor. It involves a combination of attractive appearance, high light-transmitting efficiency, proper distribution of light, elimination of glare, uniformity, and many other elements.

By selecting Gleason-Tiebout glassware for your street-lighting installation, you assure yourself of the most satisfactory results. Gleason-Tiebout glassware, a product of scientific engineering and modern manufacturing methods, combines all the important factors required in a high-grade product.

Scientifically designed glassware is essential to correct illumination. It will help to provide greater protection for your city, and, consequently, give a high return on the investment by decreasing accidents and crime.

Gleason-Tiebout makes glassware to meet the exacting specifications of General Electric engineers. These engineers will be glad to assist you in planning installations that will meet every requirement.

PROPER STREET LIGHTING PROMOTES SAFETY
DISCOURAGES CRIME AND BOOSTS BUSINESS

GT-28

GLEASON-TIEBOUT GLASS COMPANY

99 COMMERCIAL STREET, BROOKLYN, N. Y.

The Art of Fountain Lighting

THE use of fountains in beautifying public parks and private gardens has been made much more effective by the art of outdoor illumination. The play of changing lights in different colors on fountain jets and spray, controlled by varying cycles of water pressure, has created a new expression of beauty which delights multitudes of observers as it extends the evening enjoyment of open spaces in summer.

Spectacular effects in fountain illumination have been made lovelier and more varied by the development of special units for underwater lighting. Thousands of visitors to Washington each year will find pleasure in watching the illuminated fountain located on the terrace in the Capitol grounds. The illumination changes through a cycle of six colors, and the underwater floodlights, designed by Westinghouse, give a marvellous effect. This installation is one of the largest in the world in electric power and equipment.

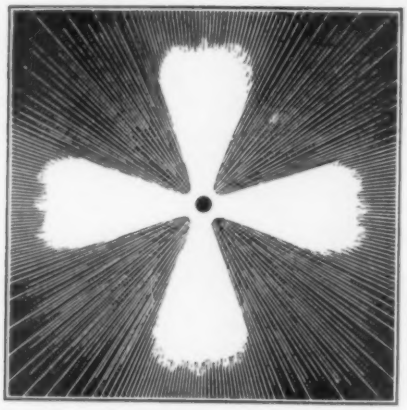
In such underwater lighting waterproof floodlights are most widely used. The light is directed to the jets or sprays and makes the water itself luminous.

The varying characteristics of fountains—jet and sprays of different heights and forms, with lighting units under water of various depths and degrees of clarity—make impossible the standardization of lighting design. The wattage, to produce a desired effect, varies greatly with the subject, and must be determined by past experience under similar conditions. In small fountains space is often the deciding factor; the area available for mounting projectors may be sufficient for only a moderate, or even inadequate, number of units.

When the fountain consists of two or more basins at different levels, the overflow from the higher basins may be illuminated at little additional expense. The most satisfactory method of lighting a waterfall is from above, by equipment concealed under the crest.

One great feature of this modern art is its power of giving individual beauty to each setting. Both large and small parks may possess installations that belong to the particular place and will be remembered by visitors as something that will call them back again and again.

THE LIGHTING OF THE FOUNTAIN AT THE NATIONAL CAPITOL, WASHINGTON, D. C.



FOR INTERSECTIONS
A separate beam for each road

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HOLOPHANE *Alone*
Shapes the Light to the Street

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Holophane Asymmetric Refractors shape the light to the character of the roadway—to the demands of traffic. They conserve the light and life of lamps. They are permanent. They are efficient because they furnish illumination only where it is needed. They are economical because you pay only for useful light. They are standard equipment with General Electric, Westinghouse, Line Material and other manufacturers.

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For engineering service or information address Holophane Company, Inc., 342 Madison Avenue, New York. Canadian Office, Toronto. Works, Newark, Ohio.

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Specify
HOLOPHANE REFRACTORS
for GREATEST ECONOMY *in*
STREET AND HIGHWAY LIGHTING

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Illumination Service since 1898

SAY IT WITH
FENCE

Fence speaks its command in unmistakable terms: "Stay out." Undesirables, unwelcome visitors and trouble makers heed its silent warning and keep their distance. When you install a fence around your property, build it to last. Buy a good fence and erect it properly for economy's sake. Pittsburgh Fence, because it is doubly protected against rust, and sturdily built of full gauge wire, will give you many extra years of service. Write for catalog. We will gladly give you an estimate of cost of fencing any property.

PITTSBURGH STEEL CO.
UNION TRUST BUILDING
PITTSBURGH, PENNA.

Pittsburgh Fence

Washington's Greatest Hotel Value

MOST of our guests are "regulars" who have been here before and liked it. This fact and our large comfortable rooms, delicious meals and real service are some of the things we boast about. You will like our location too—opposite Franklin Park, within a few minutes' walk of theatres, shops and business.

RATES
$3.00 single. $5.00 double

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Managing Director

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MAY 9 - 1934

MAY, 1934

The American City

The City of Rome, Italy, As It Looked in the Time of the Caesars

The model of the capital of the Roman Empire here reproduced was constructed to scale, 400 times smaller than the actual dimensions, by Paul Bigot, Member of the Institute of France.

The silhouette line marks the course of the River Tiber, past the Palatine Hill. At the left of the center of the model is the Circus Maximus; at the right, the Coliseum, above which is the Imperial Forum, with the temples of Constantine and Venus.

Wide World Photos